The Builder.

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The Royal Mint, Tower Hill.

LATELY we gave a few particulars of the mode adopted in "milling" money, and, as these seem to have interested some of our readers, we are led to enlarge a little on the arrangements of the national money-making establishment generally.

A squalid part of London must be threaded to reach the Mint. It is but a short distance from the Tower, and formerly was within the Tower walls, where "Mint-street" serves as a record. The present building, plain and substantial, was commenced from the designs of Mr. Johnson, and completed under Sir Robert Smirke. Soldiers and policemen guard the entrance to the court-yard in front, but these defences are readily passed on the production of an order of admission from the "master."

After crossing the court-yard, the visitor is introduced into a large unadorned hall, and thence passes to an open quadrangle of considerable area, paved and laid with several lines of railway, which are used to convey the precious metals to and from the various offices. In the buildings which surround this square are the various apartments wherein the processes of coining are carried forward. The noise and whirl of steam machinery and a heavy, rapid, thumping noise attract attention, and the visitor is taken under intelligent guidance to the melting-room, where a range of furnaces glow with a clear, bright light. Into some of these stalwart workmen are placing crucibles, charged, some with bars of gold, others with scraps of thin plates, perforated with circular holes: other furnaces are already charged, and the gold-melting is going actively forward. With great accuracy the metal has been made of the proper standard, so that a portion of a certain size and thickness may, when coined, have its right value and exact gauge and weight. Attached to the furnaces are lifts, which enable the casters to convey the molten gold from the glowing and roaring furnace to the iron mould in which the precious material is cast into bars of about 2 feet in length, about 1 inch in thickness, and 2 inches broad. The mould, as it stands ready for the operation of casting, consists of several upright frames, which have somewhat the appearance of the smaller barrels of church organs: these are so constructed that when the metal has been poured into the proper space and cooled, the mould can be made to fall to pieces, and the bars be readily taken out. The mould can then be fixed together again for further use. By long experience the casters judge when the gold has become of a proper heat and consistency. And by means of a peculiar instrument a moulded neck is then taken from the crucible. This has been placed there for the purpose of allowing the fire to be piled to a certain height above the crucibles, which are made with very great care, of plumbago and clay. With great nicety the crucible, which is not bigger than a man's head, is brought and emptied into the moulds. The gold sparkles and hisses, and with rapidity aperture after aperture is filled. One of these crucibles, when properly charged, although not full, and small as it is in size, contains 5,000 pounds worth of the metal.

The gold bar, when released from the mould, is of a dull dead yellow colour, and each bar of the size above mentioned is worth, say 2,000*l.* each; for there is a little variation in weight. In order to make it certain that the quality of the gold is of the standard value, each bar is marked and numbered; and then four or five portions are cut from various parts of the bar, each of which is sent to a different assayist, who, after testing the purity of the gold in the usual way, reports upon the matter. If all the reports agree, and provided the metal is up to the standard, the bar is passed for use.

It is then conveyed to the rolling-room, in which are a number of machines: with these the gold bars are gradually thinned and lengthened. This process has also the effect of making the metal more solid, and preventing cracks or flaws. With the greatest precision, very slowly but surely, the bars are brought to the exact thickness of a sovereign or half-sovereign, and of such a width as will allow of the diameter of two sovereigns being struck out. These long bars of gold are trimmed and adjusted by steam machinery. One instrument, which works slowly but with a terribly strong mouth, trims and shears: another cuts out the unstamped sovereigns in rapid succession, as the bar is passed along.

It is now seen that the shavings of gold which we had noticed in the melting-room for the purpose of fresh melting, are the remains of the bars after the circles for coining have been stamped out. After the "blanks" are cut out, by means of a machine of rare quality and power, the edge of each is raised. Before this the sovereigns are singularly like the bright brass buttons formerly worn on men's coats. The golden circles are, as regards form, ready now for the finishing process of milling and stamping. There is, however, much to be attended to before this is done. The future sovereigns have to be put into the annealing furnace; and, in order to effect this, they are placed in rows on their edge between thick metal plates, which are fastened together, and then all openings are fastened with clay. These cases, which contain gold to the value of 12,000*l.* or 13,000*l.*, are then placed in furnaces, which are highly heated. After remaining here from thirty to forty minutes, according to the heat of the furnace, the hot gold is dashed into cold water; thence it is removed to a vessel containing diluted sulphuric acid; then it is dashed into hot water; then it is dried in a large heated iron trough, partly filled with dry hot sawdust; next they are put into a perforated cylinder, which is caused to revolve in a heated oven: and by these various processes the gold is properly tempered, and all impurity is removed from the surface.

Now the gold is taken to an apartment in which each piece is weighed and sounded for the purpose of detecting any cracked or imperfect specimens. In this room, and in some of the others here, there is an unceasing ring of falling gold. In one place the workmen are throwing with great rapidity the metal upon small steel anvils: the least defect is readily heard, and those displaying it are sent again to the melting-pot. All the golden circles which pass this last examination are weighed by eight machines, so delicate and beautiful that it is difficult without the aid of illustrations to give an idea of their construction. It must therefore suffice to mention that long rows of sovereigns are placed edgeways in a groove, which is arranged at such a gradient that it allows one piece at a time to fall on a balance. Here it remains an instant, as if to give the machine time to consider of its quality. Then the piece of gold is dropped into one of three drawers placed below, one marked *heavy*, another *medium*, and a third *light*. With the most certain exactness each of these instruments weighs and disposes of the intended coins, at the rate of about twenty a minute. The medium and heavy gold is next passed to the coining-room, and the light is sent back to the furnace. One hundred and fifty thousand sovereigns can be prepared and coined in one day at the Royal Mint. Before going to the coining-room, it is worth while to see the department in which the dies are prepared.

All the dies for gold, silver, or copper are cut within the walls of the Mint, and these are required not only for Great Britain, but also for India, Australia, and other colonies. It may be necessary to mention that the original die for each description of money is cut in steel, which for the convenience of the artist is tempered to a certain degree of softness. When the work is done, it is hardened, and is used to transfer the impression by means of great pressure on to softened steel, and thus to obtain the requisite number of dies. For this purpose there is a press of tremendous power. In front of this a circular piece of steel, of about the size and something of the shape of a little boy's whipping-top, is fixed. The original hardened die is brought into use, and after five or six heavy blows, the required impression is made. Several of these are needed, for sometimes this important part of the coining process gets unfit for use in a very short time. After leaving the press just referred to, the impressions are cleaned and touched where necessary; then the die-turner polishes them off, and cuts away all superfluity; and after hardening, the die is fit for its position in the coining apparatus. Here we saw dies for gold, and silver, and copper money; dies for Calcutta and other distant places, to be used at the mints established there;* little dies for marking the Queen's "Maundy money," which consists of 1, 2, 3, and 4, penny pieces. Wonderful order reigns in every part, as it need do, remembering the vast quantities of bullion which are passed through the various departments and courses of manufacture, in order that no loss may take place nor mistakes be made. We proceed through carefully-locked doors towards the coining-presses. At each step onward the sound becomes more deafening. In the coining-room are eight presses, which, by the force of a blow of 40 tons weight, impress the well-loved face of the Queen, the reverse of the coin, and, at the same time, mill the edge of the coin in the way previously described. From each press, the perfect sovereigns are thrown off at the rate of sixty-four in the minute. At this rate, supposing that all the presses could be kept working, a stream of 30,720 sovereigns would run out in an hour. Each batch of coins is assayed by the Queen's assayer. One coin of each kind is then placed in a pix or casket, secured with three locks and three seals, and this is given to a jury to compare with the trial-plates, preserved in the Chamber of the Pix at Westminster, of which our readers have heard.

Returning by some of the streets behind the Minories, the wretched abodes of half-starved inmates come into contrast with the running stream of gold we have left behind, and suggest matter for reflection.

THE METROPOLITAN MAIN-DRAINAGE:

THE DEPTFORD PUMPING STATION AND MACHINERY.

THE progress of the metropolitan sewerage has been met by obstacles of a character almost impossible to be provided against: it is, however, much greater than is commonly supposed. Certain opinions at one time, as to the effects of the strike in the building trades on the progress of the Northern High-level Sewer, obtained credence; but the issue at present is not what was apprehended; and, although difficulties have occurred in letting works on the south side of the Thames, which in the case of the Outfall Sewer have been thought to render necessary a fresh call for tenders, there is every prospect that within a period much earlier than was predicted by some persons, the system devised as a whole, for London, will be undergoing partially the test of use. Let us hope that whatever fears may have been expressed, whether as to results of the subtraction of water from the volume of the Thames above bridge, the substitution merely of other channels and vomitories

* The chief part of the copper coin is made at Birmingham, but the dies are supplied from Tower-hill.

of nuisance for the present outfalls and the river, or other imputed errors in the scheme, may be discovered to have been without reason. We have already spoken of the intention which there is, of trying the efficacy of the furnace system of ventilation at the pumping stations. We have not yet the means of judging how far this method, which is said to have succeeded in the provinces, and has, on the other hand, been considered inapplicable where there are numerous inlets, will answer for sewers several miles in length; but we may shortly have it in our power to give particulars of arrangements intended to be subservient to the object, in addition to some which will fall within the scope of the machinery and contrivances of which we are now about to offer information.

Whatever the progress of the sewerage, assiduity and care on the part of the engineering staff, in the preparation of the drawings and specifications, and in superintendence of the works, are not wanting, and we have, therefore, been able to give our readers the detailed particulars of the intended course and construction of the principal sewers, north and south of the Thames, including some which have not yet been tendered for. In these particulars, as well as in the general account of the whole scheme at the beginning of our last volume, it will have been made sufficiently clear how much of the success of the general undertaking must be dependent upon the design and execution of the pumping machinery needed for the elevation of the sewage of the extensive low-lying districts, each side of the Thames, — and for that indeed of the whole sewage of the south side, at least at the point of outfall below Woolwich. With the exception of the case last alluded to, the pumping machinery at the station on the Lea, north side, and by Deptford Creek, south side, is simply for the elevation of the *low-level* sewage to the high-level, or that of the outfall sewers. In these cases, however, the volume of liquid to be raised is enormous, even considering that the high-level lines will intercept the great body of water now finding its way to the Thames across these low-levels, or which has been, on occasion of storms concurrent with the time of high-water, stored up for some hours in the sewers, to the inconvenience and injury of the residents in those districts. The construction of the high-level sewers, prior to that of the low-level sewers, was necessary or desirable in an engineering point of view; and, being itself calculated to afford great relief to the residents in the low-levels, the clamour at one time against the postponement of the low-level sewers, raised on the ground that these last were most wanted, was not justified.

The liquid to be raised from these low levels, is not merely to be considered as large in quantity; but it may be, from the character of those districts, sewage in the most concentrated form,—and of course more so after the upland waters have been intercepted, than at present. The existing sewers and outlets, however, will be available, it is expected, in most cases, for dilution or flushing with water from the river. Even anticipating that there will be such dilution, before deciding upon the description of contrivance at the pumping stations, it is not altogether unnecessary to take into account the habits of the people who reside in many parts of the districts, the indescribable "flotson and jetsam" which have to float or be deposited, and the liability which ensues, of obstructions to the working of pumps. Considerations of this latter nature, drawn from the known condition, as at present, of sewers which appear to be not unfavourably situated, have, as we shall see in the sequel, led to predictions of the failure of all machinery in which there are valves. We can scarcely suppose that these risks have not been very carefully estimated by Mr. Bazalgette, and disposed of, in his mind, in favour of the ordinary principle of the "lift-and-force" pump which he intends adopting; indeed, he has, by designing the foot or base of each of his pump-cylinders, as a fender-grating, provided the means of stopping access to the valves of such obstructive matters in the sewage, as could not pass through an orifice of about 2 feet 10 inches by 9 inches,—an area, however, which is larger than that of each of his valves: but considering the immense importance of the question, we shall do right to allude to views which have been held by others. First of all, we will describe the arrangements as they appear from drawings and a specification which have been prepared for the Deptford pumping machinery, and from information which we have been able to gather in various ways.

The drawings are not, to ourselves, quite so explanatory as those which we have had previously to examine,—partly because we here anticipate the completion of the specification for one portion of the work,—that which is structural, or not belonging to the department of mechanical engineering, and consisting of the engine-houses themselves, and the boiler-house, the chimney, and the sewers in their course joining to the machinery,—and partly, perhaps, because in the details of the machinery there is much alluded to only, for which the contractors are to submit drawings. The drawings now before us, show the buildings as well as the machinery in them; but the specification refers to the machinery only. Besides the omissions last alluded to in details of the machinery, there are others which might not have been noticeable had the specifications for the whole of the work been before us, or written explanation upon the drawings been less sparingly given than it is. We can gather enough, however, from the various sources of information, to afford matter which may interest our readers. The machinery is to be completed to the satisfaction of the engineer of the Metropolitan Board; and the drawings have doubtless been prepared in great measure under his supervision; but it would not be fair, should defects occur, to impute all those of the steam-engines, or even pumping machinery, should such there be, to a civil engineer, especially as Mr. Bazalgette informed the Board, some time time since, that the designing of such machinery was not his "speciality."

The contract for mechanical engineering work of the Deptford pumping station, is to include four steam-engines and ten boilers, eight single-acting force-pumps for the sewage, and two large wrought-iron delivery troughs, four vacuum vessels for the cold pumps, two air-vessels for the feed-pumps, and other articles described. The arrangement of the engines and pumps may be best understood by the aid of a description of the buildings in which the machinery is contained.

The pumping station is intended to be fixed in ground by Deptford-creek, and on the eastern bank, immediately adjoining the Greenwich line of railway. The spot is nearer to the Thames, by perhaps a furlong, than that where, on the opposite side of the Creek, is the temporary outfall, or future storm-water outfall, now in course of construction, of the High-level Sewer. It will be recollected that there is a length of the intended Outfall Sewer, amounting to about a quarter of a mile, and extending from the commencement of Church-street, Deptford, to North Pole-lane, which has not yet been made the subject of any contract, or advertisement for tenders; though this length will eventually be required as part of the line of the Outfall Sewer, which last is one with the line of the "high-level," from which, at Church-street, the temporary outfall, as before named, branches off. The pumping station will be close to North Pole-lane, or near to the point of commencement of the length which was the subject of the last tenders, and those last advertised for. At this point, the invert of the Outfall Sewer is shown on the drawings, which we described in our last volume,* as 13 feet 6 inches below Trinity high-water mark. To that level the low-level sewage has to be raised, or a height of 17 feet from the invert of one sewer to the invert or bottom of the other. The sewage actually will be raised from two channels divergent from the Low-level Sewer, into sewer-troughs, spoken of as part of the present required contract; and thence the lines will converge into the one line of the Outfall Sewer. The troughs are at the distance of 136 feet 3 inches from centre to centre, apart, as shown on the drawings; each trough being in length 51 feet, somewhat less than the length of the engine-house in which it is placed, and just below the ground-level, in a central position, between sewage pumps, which are two on one side of it and two on the other. Each pair of pumps is worked by an engine above. The low-level sewage having passed under the Creek, will be received into a large space, which may be called the basement story of the engine-house, in which the four pumps are fixed on supports of two iron girders built into the brickwork of the flooring. Each pump will be cast in three pieces, and be single-acting, having a plunger case of 9 feet diameter, "with a cast-iron plunger of 7 feet diameter and 4 feet 6 inches stroke; also a short wrought-iron plunger-rod, of 6 inches diameter, which shall be cottered into a socket formed at the lower end of the plunger, and shall be attached at the top to a strong wrought or cast iron (and if the latter, feathered) pump-rod, which pump-rod shall be attached at the head to the cross-gudgeon of the back-link of the outer and inner end parallel motions respectively,"—that is to say, the pump-rods will be worked by the beam of the engine, the sewage-pumps occupying the positions of the air-pump, cold-pump, and feed-pump, in most steam-engines; whilst for those latter parts of each engine, space is provided beyond the cylinder, and a counter-beam for their working will be provided, tailed to a vibrating pillar fixed in the end wall of the engine-house, and connected at the other end to the cap-gudgeon of the piston-rod, a proper parallel motion being attached for the air-pump, guided by radius rods connected to the lower gudgeon of the vibratory pillar.

* Page 770.

The machinery is designed to elevate the sewage-water to a total height of 20 feet. The quantity to be raised in twenty-four hours, dry weather, is estimated at 3,400,000 cubic feet; but for six or eight hours of the time, the estimate is that 4,720 cubic feet per minute must be raised, the quantity decreasing gradually to 1,000 cubic feet per minute. The machinery, however, is provided with the view of meeting all emergencies, such as those of excessive rain-fall, when all direct outlets to the river might happen to be closed by the tide; and in these cases the amount calculated to be raised is 10,900 cubic feet per minute. The nominal horse-power of the engines will be that, for each, of 125 horses, or for all, that of 500 horses; and these engines are to be of not less strength than equivalent to at least ten times the maximum pressure (estimated at 35 tons), of the steam on the piston, being intended to work expansively with a pressure on the boilers of about 25lbs. per square inch above the pressure of the atmosphere. They will be of the kind "known as Watt's double-powered rotative expansive house-engines," and will have cylinders of 48 inches diameter, and 9 feet stroke, and beams of not less than 60 inches deep in the centre (where they are supported by an entablature and six iron columns and arches, across the engine-house), the distance from the centre of the beam to the line of the cylinders, and to the centre line of the cranks for the motion of the fly-wheel, being in each case 15 feet 9 inches; whilst the distance to the centre line of each sewage pump is one half, or 7 feet 10½ inches. The fly-wheels of the four engines will be each 27 feet in diameter, and will be of unusual weight, having rims 18 inches deep and 9 inches wide, to provide for the passage of the dead-points with facility when the engines are working at a slow speed. There is a parallel-motion, it will be understood, at *each* end of the beam, in order to work the sewage pumps. Many details of the engines are specified,—though necessarily, so as to confide much to the contractor: but into these we will not enter much further. The air-pumps and condensers are to be respectively, of 32 inches diameter, or thereabout, placed in iron cisterns, and fitted with hot wells and other requisites: the cold pumps are to be each of 18 inches diameter and 27 inches stroke, drawing from a vacuum vessel of 2 feet diameter, and 9½ feet high, to which an 18-inch suction-pipe, of 200 yards long, with hanging valves and wind-bore piece, is to be attached; and the feed-pumps are to have each a solid cast-iron plunger of 6 inches diameter, and 27 inches stroke, each pair of pumps to be united to an air vessel 2 feet diameter, and 5 feet 6 inches high, to which will be attached a 7-inch feed-pipe leading to the boilers, with 3-inch branches entering below the bottoms thereof. In lieu of the feed-pumps, or in addition thereto, the engineer may require for each boiler, one of Giffard's self-acting water-injections.

Each engine-house will measure in the clear of the walls 59 feet 3 inches by 38 feet 9 inches, and will be about 35 feet in height of the walls, from the main floor line. The walls will be 3 feet thick, strengthened at intervals by pilasters of half-brick projection. Below the floor line, to the bottom of the footings, which will be a mass of brickwork from 5 to 8 feet in vertical thickness, will be a depth of 43 feet 6 inches; in which the external walls will be 4 feet 1½ inch, and there will be cross walls or piers, of 5 or 7 feet thick, where needed for the support of the several parts of the machinery, the cross walls having arched openings in them where required for the flow of the sewage from one part of the basement to another, and for the passage of the iron sewer-trough of the upper level. The two engine-houses will be distant from one another 91 feet 6 inches; the interval being occupied by the boiler-house, appearing as one story in height, with the chimney rising from the ground, a height of 150 feet, at the back of it. The decorative character of the buildings, which are to be brick, with Italian dressings in stone, might certainly be improved.

The chimney, as shown, is an elongated Roman Doric column on a pedestal. A capping which would be more effective at the height, and would not give the resemblance to the column, which is now objectionable, might be designed, so that the result would be something having a distinctive character as a chimney, and one every way agreeable to the eye. The buildings will be covered with light iron roofs, which will be surmounted externally with ventilators; the stone cills and cornices will tail through the full thickness of the wall; and the work in all respects is intended to be of the most durable description. The contractor for the machinery is to fix wrought-iron lifting beams required for raising the machinery. The chimney, 18 feet square at the base in the external dimensions, will be 8 feet 6 inches in the clear at the base of the circular shaft, and 6 feet at the top, the brickwork in the shaft being 1 foot 10½ inches, 1 foot 6 inches, and 1 foot 1½ inch.

The boiler-house will measure in the clear, 91 feet 6 inches by 51 feet; and the internal height from the floor line to the top of the walls (which last, or the front and back walls, will be 1 foot 6 inches in thickness, exclusive of the pilasters) will be 15 feet. The boilers, ten in number, will be cylindrical single-flued boilers, 30 feet in length and 6 feet in diameter—the flues 3 feet in diameter. The plates of the shell, the best Staffordshire or other esteemed iron, are to be ⅜ inch thick; and the tube and furnace plates, of guaranteed Low Moor iron, are to be, the former, ⅜ inch thick, and the latter, 7/16 inch thick. Not fewer than seven ¾-inch rivets are to be placed in a foot of the seams, which are to be soundly caulked. Extending, together, across the whole range of boilers, there are to be two steam chests 3 feet diameter, made of plates ⅝ of an inch thick; and these are to communicate with the boilers by lateral pipes connected to the stop-valve boxes or steam jugs; whilst upon the chests will be fixed two steam-pipes of 18 inches diameter, each dividing into two branches leading to the engines. Many details of the boiler-apparatus and fireplaces are merely named in the specification. Attention has, we believe, been given to the economizing of fuel; and it is to be hoped that the same attention will be paid to the prevention of smoke nuisance. The double-flued arrangement, sometimes considered advantageous for the object last mentioned, possibly has been considered from recent experience to involve greater chance of accident, than that of single flues which is to be adopted.

To complete the description of the machinery, it is necessary to examine into the arrangement of the valves of the sewage pumps, upon which we have said so much depends. In each pump, the areas of suction and delivery are divided, in each area, into a considerable number of valves, which will work at the same time, but independently of one another. Thus the suction-valves may be between thirty and forty in number, distributed over the area of the cylinder or plunger-case, at the height of 11 feet from the base, where the diameter increases to 9 feet,—the seats of these valves being cast in one piece, or as a sort of grating in the appearance on a small scale in drawings. Each ordinary opening covered by a valve, will measure 1 foot 6 inches by 9 inches; and the valves will be formed of leather ¼ inch thick (which is to have lain in the tan-pit for two years), screwed between two "valve-irons," or plates: the small portion of the valve which serves as the hinge, however, is necessarily, the leather only. The delivery-valve box, of which the lower part of the clear opening is 9 feet 10 inches above the suction-valves, and measures 9 feet 2 inches in the whole clear width, by 3 feet 10 inches in height, is to be cast on the plunger-case, and fitted with a face-plate for twenty hanging valves to openings which measure 1 foot 7½ inches by 8 inches. Care is to be taken in making the valve seats, to have the centres of bolts and size of the openings to correspond with one another, so that they may take each other's places if required. The sewage will be delivered through these valves of the four pumps, directly into the iron trough which is below the floor of the engine-house; each pair of pumps as before described, being worked by an engine; and each engine-house (distant from the other 91 feet 6 inches) containing on different levels, four pumps, one iron trough, and two engines.

The trough placed in the centre of the engine-house, will be 51 feet long as already mentioned, arch-headed in the cross-section, and with a division down the centre; and will be 8 feet in the width, and 11 feet 6 inches in the whole height. It will be formed of ⅜-inch boiler-plate, with angle iron strengthening pieces, and cross-ties. There will be proper man-holes, and removeable plates, to give access to the pump-valves and to the interior of the iron trough. Whether similarly efficient means will be provided for the *prevention* of obstruction, beyond what we have named in describing the formation of the feet of the pumps, we cannot be fully aware until the drawings for the sewers themselves of the low-level are before us. It will, however, have been noticed, that each opening of the valves is, as we said, less in area than the opening at the feet of the pumps through which the sewage will find admission.*

ON THE RATIONALE OF GOTHIC ARCHITECTURE.

MR. SCOTT'S SECOND LECTURE AT THE ROYAL ACADEMY.

IN my last lecture I traced out the *rationale* of a number of the leading features, both of Romanesque, as distinguished from Roman architecture, and subsequently of Gothic as distinguished from Romanesque. I will endeavour to avoid wearying you by carrying the inquiry into too great a multiplicity of details, but I must, nevertheless, ask your indulgence while I pursue them somewhat further than I have yet done.

Nothing would, perhaps, do more to show the reasonableness of the various developments in question than to trace out the details of the vaulting system; to show the varieties it exhibited in different countries and provinces and at different periods; the various modes adopted for effecting a given purpose, and the many mechanical and other difficulties to be contended with, and the methods adopted of meeting them. This is, however, so extensive and so intricate a subject, that, if I had devoted these two lectures exclusively to it, I could barely have done it justice. I will therefore at present content myself with referring those of you who are anxious to make themselves acquainted with it, to an admirable and elaborate essay on the subject by Professor Willis, in the Transactions of the Institute of British Architects, and to the article "Construction," in the fourth volume of Viollet le Duc's Dictionary. No one who has not gone carefully and practically into the subject can have any idea of the amount of forethought which it demands; so much so that, as Viollet le Duc says, the design for a vaulted building has to be commenced at the top, and worked downwards; and we may often form a pretty correct idea, from the bases of a thirteenth-century church, of what was the plan and construction of its vaulting.

This principle of designing each part from the first with reference to its ultimate intention, is very strongly marked in French work of the twelfth and thirteenth centuries, and in those of the transitional period in England. The form, not only of the capital but even of the base of each shaft, usually indicates the direction of the arched rib or order which it is destined to carry.

This was, however, lost in English works on the introduction of the circular abacus, and I must say that much expression and emphasis was lost with it. Not only, indeed, did the abacus in French work face or point in the direction of the arched rib, but its plan was often made to fit to it in the most direct manner, and even the direction of the principal stalks of the foliage had reference to the supported rib.

The system of moulding again follows out the same laws of reason. An arch-moulding, for instance, is founded on what is supposed to be the original section of the order or rib. Thus, if the normal section of the rib be square, the section of the mouldings is made to fit to that figure: if chamfered or a part of an octagon, the mouldings, again, fit to it; the abacus in each case taking the normal plan of the ribs.

As to æsthetical forms, the mouldings were studiously arranged so as to produce in some parts the greatest contrasts, in others the most elegant gradations of light and shade. The heaviness of large roll mouldings was often relieved by fillets or by raised edges or "keels," by which diversity was gained without loss of mass.

Hollows, again, were relieved by the insertion of sparkling ornaments, such as the toothed ornament, the rosette, the ball-flower, the four-leaved flower, and many others; and in other instances by the introduction of bands of foliage. The sections of moulding differed entirely from those of Roman architecture, being far more free and less mechanical, and at once more delicate in feeling, more carefully studied with reference to light and shade. They resembled Greek mouldings, in fact, far more than Roman.

Enriched mouldings differed from the usual practice in antique work in this respect, that the enrichment was added to instead of being cut out of the original moulding; its practical use being to strengthen the hollows rather than to enrich the rounds. In this respect the practice of the Romanesque builder had been different, and perhaps a union of the two systems would be better than a close adherence to either.

Mouldings which receive much rain, as copings, cills, tops of cornices, &c., were very much more sloped than in Classic work, so as to throw off the wet more rapidly. The custom in modern Classic buildings, where the stone is not very hard, of putting lead on the upper surface, as well as the damage often sustained when this is neglected, show the reasonableness of this increased slope. They had to do with a more rainy climate, and generally with softer stone than the ancients, and they designed their work accordingly. The undersides, again, of projecting mouldings, as string-courses, dripstones, water-tables, cills, &c., were carefully designed so as to prevent the wet from running round them. Base moulding round buildings was designed in such a manner as both really and apparently to give it a substantial footing, and at the same time to add greatly to its beauty: many of them are as noble combinations as could easily be conceived.

In short, it may be asserted, without fear of contradiction, that in no style of architecture has a system of moulding been generated so full of variety and so capable of suiting itself to every position, and not only to provide for the practical demands of each position, but to give to each just that kind of effect which it most demanded.

Let us now proceed to consider the *window*. In the days of ancient Greece, and in the earlier days of Rome, windows were necessarily kept in a very undeveloped form, through the non-existence of window glass; so much so, that in Classic architecture the window seems a thing shunned as an unhappy necessity; and the imperfect manufacture and dearness of this material, no doubt, influenced, in a considerable degree, the architecture of the later Roman and the immediately succeeding periods. In churches, and other vaulted buildings, another cause would lead to the use, during the last-named (*i.e.*, the Romanesque) period, of as small windows as would just answer the purpose. The unaided thickness and the whole length of the wall being relied on for the abutment of the vaulting, it naturally followed that perforations were as much avoided as possible, as tending to reduce the abutting mass. Accordingly, as buttresses increased in projection, greater and greater openings in the curtain wall were ventured on, simply because there was strength sufficient to admit of them; till, when Pointed architecture received its full developement, and the pressure of the vaults was entirely concentrated upon the buttresses, the whole intervening space might, if needful, be converted into windows.

Simultaneously with this change, the increasing use of stained glass *necessitated* a corresponding increase in the area of window opening, so that we have one developement *facilitating*, and the other *rendering necessary*, the constant enlargement and multiplication of the windows.

The *primâ-facie* mode of obtaining increased window-light would be to widen the openings; but as this, if carried too far, would at once injure the beauty of the window, and cause inconvenience in glazing it, the more usual course adopted was to increase their *number*. Hence the couplets, triplets, and more numerous groups of the early English windows. These groups, when placed in a side-wall and under a level roof-plate, would naturally assume the form of arcades of equal height; but when under a gable, an arched roof, or a vaulted bay, they increased in height towards the centre,—thus giving us the two most familiar forms of grouping. The sections of the jambs were arranged (as in the earlier period) in the manner best suited to the admission of light,—care being taken externally, to avoid deep shadows upon the glass, and internally, to disperse the light, as readily as possible, through the building.

In domestic buildings, where windows have to serve the double purpose of admitting the light and facilitating external view, they were not usually grouped as above described, but were made wider in their openings, the unpleasant effect which might otherwise arise from it being obviated, and the glazing and opening of the window rendered more easy, by the use of thin mullions or pillars dividing the window into two or more lights. This system offered advantages so obvious that it was very soon adopted for churches also; so that,

* To be continued.

instead of obtaining increased light, as heretofore, by the indefinite multiplication of comparatively small windows, it became customary now, *for the first time in the history of architecture*, to make windows of *any* size which their position or utility might dictate; the whole end of a church and the entire bays of its flanks being occupied, if need be, by single windows.

Now nothing could be more rational than this development. The mode of glazing in use was most conveniently applicable to spaces of moderate width. It is true that by the more extended use of iron it was then, as it has often been in modern times, applied to openings of 6, 8, or even 10 feet in width; but narrower spaces were much more convenient. The lights, however, at Westminster Abbey, which is one of the earliest buildings in which this kind of window is systematically used in this country, are 4½ feet wide, and in France they are generally much more. The prevailing practice of placing a massive pier between each of such lights was obviously imperfect. The concentration of pressure upon the buttresses now allowed of openings of almost any size: what, then, was more reasonable than to make extensive openings, and then to subdivide them by light mullions into compartments at once sightly and convenient? That this practice has sometimes, from caprice, been carried to a vicious excess in no degree militates against its *rationale;* indeed, with all our modern facilities for glazing and opening our windows, we continually find the same expedient resorted to for convenience, and invariably so when any extraordinary amount of light, and consequent width of window, are needed.

The next question which would arise is, how is the arch to be filled in? This we find done at first by a plate or tympanum of stone as thick as the depth of the mullions, each light being arched, and the tympanum pierced at pleasure with such openings as suited the builder's taste; and, later on, we find these piercings connected together into those systematic groups which we call tracery; thus converting the window into a perfectly novel and most beautiful architectural feature.

As I shall have more to say on the subject of windows when we come to secular architecture, I will limit myself to two remarks. One is this; that in positions in which there is not much height, where there is no great load to be sustained, and where the termination of the wall internally and externally is horizontal, the mediæval architects by no means held themselves bound to the arched form, but reserved perfect liberty to put square heads to their windows: the other is a passing remark on the *rationale* of *stained glass*. I do not conceive it to be simply a decoration, or a means of adding rich colouring; but that it also arose from an unconscious feeling that it was necessary to the perfect effect of an architectural interior that it should be self-inclosed. In a living room one wishes not only for admission of light, but for facility of looking out at the windows; and this necessity prevents us from seeing the windows well as architectural features, because the focus of the eye has constantly to be changed in passing from the window itself to the view beyond. In a church, on the contrary, you do not wish to look out at the window, and it is better that it should be filled with a medium only semi-transparent, and which, being at about the same distance from the eye with the surrounding architecture, at once does away with the necessity of a change of focus, and supplies a beautiful decoration to the medium by which that object is effected.

I have not yet noticed one of the leading features of the style, and one in which it assumes a character most peculiarly its own: I mean the *roof*.

All previous styles of architecture with which we are acquainted, having originated in southern countries, had roofs of a low pitch. I have no doubt that in many of these countries there were occasions in which a higher pitch would have answered better; but, as the lower line harmonized better with the generally horizontal lines of their architecture, and was found to answer, they naturally adopted it. The Romanesque architecture of southern Europe had also somewhat low roofs, and when first imported into Germany the roofs were by no means high. Gradually, however, as men forgot its connection with Italy, and viewed it as belonging to themselves, they would naturally use with it the form of roof they had found most serviceable, and were most accustomed to in their ordinary buildings; and thus the high roof of the north became engrafted upon the Romanesque style, and the roof became a conspicuous feature in external architecture. Happily this change harmonized well with its general character. The arch seemed to suggest a higher pitch of roof than did trabeated construction; and, when greater height was generally introduced, and the pointed arch took the place of the round, the pitch of the roof would be increased to harmonize with it.

I view, then, the high roof as partly the result of climate and partly of the æsthetic tendency of the style. But is it to be considered as an essential characteristic of Gothic architecture? By no means. The true characteristic of the style is *liberty;* and in the roof, as in every other feature, perfect freedom is reserved, so that we find roofs varying from almost perfect flatness to a very high pitch, a preference being given, *cæteris paribus*, to the high roof, where there was not some decided objection to its use.

In internal construction also the roof was founded on rational principles,—good construction being always considered before beauty, but the latter made very generally to result from it.

Gothic timber roofs would form a subject which could hardly be done justice to under one or two lectures, so I will not go further into them now. Modern carpentry has shown us how to construct roofs with less timber than was used in these structures (there was then less necessity for the economy of timber), but we have never done anything to compete with the noble pieces of ornamented carpentering bequeathed to us by our Mediæval forefathers. As to covering of roofs, I may just mention, in passing, that though the Mediæval builders made use of every material which it is customary to use for this purpose, there are several which cannot be made use of with any but a high pitch, and are therefore unuseable with low roofs such as are used in other styles. As for instance, plain tiles, ordinary stone, slate, shingle, and thatch.

The next point in the *rationale* of Gothic architecture is one which I by no means claim as its peculiar property, inasmuch as it is common to all *good* architecture, though certainly our style is somewhat pre-eminent in its adoption of it. I refer to that general principle of ornamentation which trusts mainly for beauty to the useful and constructive features of the building, rather than to those which are introduced directly for appearance.

Thus, in a noble Gothic building, the ornamental character arises from a greater or less richness in the *doorways*, in the *windows*, the buttresses, the *cornices*, *parapets*, or other parts needful for the uses or construction of the building. This belongs to all noble architecture, but is more thoroughly, I think, carried out in Gothic than in other styles, and perhaps less so in modern Italian, especially in what is commonly called Palladian, than in any other. I do not lay claim to it as an argument in favour of one style above another, for all *ought* to possess it alike; but the absence of it in a very great deal of modern architecture is at least a proof that much reformation is needed among ourselves; and the strong degree in which it was adopted as a maxim by the Gothic architects is a great proof of the reasonableness of the principles on which they acted.

There are, of course, in all styles of architecture, decorations of a merely gratuitous kind; and, when largeness of means leads to profusion, they are likely to be carried to excess; but, in Gothic architecture of the best periods, the beauty of a building (after good proportion, outline, &c., are secured), depends not on this deliberate ornamentation, but on the artistic treatment of the necessary features. Whatever parts were dictated by practical necessity were the chief objects on which decoration was expended and to which the architect trusted for the beauty of his building.

More especially was it, *par eminence*, a *window style*. Of all the objects provided for, the *admission of light* was the first and chiefest: accordingly, the window was made, both within and without, the leading source of beauty. It is by the design of the *windows* that we define the gradations of style. It is chiefly by the *windows* that we describe a building, and the first question asked about a Gothic building generally relates to its *windows*. On them, therefore, was expended a large portion of the architectural decoration. How marvellous, then, is the inconsistency which we meet with;—people with one breath objecting to Gothic architecture—the offspring of Northern climes—as not admitting light enough, and urging the use of Southern architecture, to obviate the imagined defect; and then telling you of the beauties of a modern building, the great characteristic of which is, that its principal façade has no windows at all.

Next to the windows the *doorways* claim the most careful attention. Indeed, in some respects, they had the precedence, in as much as of all parts of a building the doorway is that which challenges the closest inspection. The decorations, consequently, of doorways were those which contain the greatest amount of actual sculptured art. It is a great principle to place sculpture where it will be best seen; and as every one who enters a building must of necessity obtain a close view of the doorways, they were naturally made the great vehicles for sculpture. In France especially, every part of the doorway frequently is sculptured. Take, for example, the western portals at Amiens: the pedestal or basement of the jambs is decorated with medallions, illustrating Bible history, by bas-reliefs. The jambs contain colossal statues of saints: the central pillar of the great double doorway contains the chief statue: the tympanum is filled with subjects, and the orders of the arch with angelic figures; so that the entire doorways are alive with sculpture.

The buttresses, again,—those naturally uncouth projections, mere inert masses, to resist the pressure from within,—are rendered beautiful by their stately proportions and architectural details, the niches and statues which adorn their receding stages, and the aspiring pinnacles by which they are crowned.

The stone roof-plate, enriched with mouldings, and foliage, and, perhaps, supported on sculptured corbels, becomes the crowning horizontal feature; and the parapet—the defence of the workmen engaged on the roofs—is pierced into tracery, or forms a miniature arcade, giving delicacy and lightness of effect to the generally-massive structure; while the bell-tower, raised high, to make its voice heard from afar, becomes the culminating ornament of the whole exterior: so completely was it the recognized principle of the architecture to render the useful and constructive parts sources of decoration, that, where any deliberate decoration was made use of, it was often formed of imitations of constructional features,—such as window tracery, arcades, gables, pinnacles, columns, &c.

I am not prepared to say that this is in itself to be applauded; indeed, I think, it ought, at the least, to be kept within moderate limits; but it, nevertheless, owed its origin to the firm hold which the principle of rendering construction, the leading source of decoration, had upon the architects. Being accustomed to decorate construction, they got into the habit of using constructive forms as decorations.*

THE AMERICAN MILL-FALL.

The inquest on the bodies of the unfortunates who were killed by the fall of the Pemberton Mill, at Lawrence, and the fire which followed, has been exciting great interest. The verdict had not been given when our letters left. The immediate cause of the fall appears to have been the breaking of one of the iron pillars supporting the floor. The pillars are said to have been badly cast, of bad metal. The *Boston Journal* writes:—

"The pillars on which the mill depended for almost its entire support were much too light, and there were not enough of them. In fact there were only two-fifths of the number requisite for security, for it is certainly bad construction to leave an area of 20 feet by 54 feet (1,080 square feet) with all the heavy machinery upon and above it dependent for its entire support upon one small and perhaps carelessly cast iron pillar. Architects generally consider that 12 feet between the supports of floors framed like those in the Pemberton Mills is a large space. But here the pillars were 27 feet apart. The only wonder is that the mill could have stood for so many years before the weight and motion together crushed it to the earth. The theory that the weight and force of the machinery were no more than such pillars were capable of sustaining in an exactly perpendicular state was well enough for a theory but not for practice. Allowance should have been made for accidents, and care taken to have had sufficient supports, so that, if any one got out of plumb or failed from some unforeseen cause, it should not have involved the others in a general ruin.

At the time the Pemberton Mill was erected, there appears to have been no architect employed to make the plans and superintend the building. Singular as it may appear, it is almost always the case, that factory buildings, in the construction of which the greatest care should be taken, are

* To be continued.

planned and superintended by others than architects; or, if an architect is employed, it is simply for the purpose of making an ornamental design for the exterior of the structure, the sizes, heights, and openings being furnished him by the proprietors or engineer, and no voice being given him in the arrangement of any other part. This is a serious neglect, and one likely to lead to such accidents as the recent one at Lawrence."

HARTLEY INSTITUTE COMPETITION.

At the meeting of the Southampton Town Council, held on Wednesday, the 8th, Professor Donaldson's report was read, the pith of which we gave in our last number. The following is a list of all the designs:—

No. 1.—Fortuna favet audaces	No. 22.—Omnia spero
2.—A device	23.—Sigma
3.—Nil sine labore	24.—Perseverance
4.—Fortiter	25.—In memoriam (mediæval)
5.—{ Quello / Questo } same author	26.—Truth
6.—The Southern Liverpool	27.—Silva
7.—A shield, a second design, same device as 31	28.—Prodesse quam conspici
8.—Utilitas Fermitas	29.—In memoriam (Italian)
9.—Scientia	30.—Spe
10.—Literature, science, arts	31.—Same device as 7
11.—Fit via vi	32.—Architecture for 1860
12.—I'll win if I can	33.—Labore et honore
13.—V.R.	34.—Utility
14.—Success to Southampton	35.—Præmonstrator
15.—Argonaut	36.—Utility
16.—Multum in parvo	37.—MDCCCLX
17.—Desideratum	38.—Omega
18.—Volunteer	39.—Spes
19.—Comme ça	40.—Res non verba
20.—Amor patriæ	41.—Within compass
21.—Spero	42.—Ingenuas didicisse fideliter artes
	43.—In manus
	44.—Stella

The referee selected the following as prominently deserving of notice, and estimated them at the sums attached:—

No. 15.—Argonaut	£12,300
19.—Comme ça	14,000
20.—Amor patriæ	20,000
28.—Prodesse quam conspici	15,000
31.—A shield	22,000
33.—Labore et honore	17,700
34.—Utility—an inferior design	16,000
40.—Res non verba	20,000
44.—Stella	8,000

After suggesting that the authors of "Stella" and "Argonaut" might be communicated with, his report thus concluded:—

"The authors of the following designs evince high merit, both in the disposition of plan, and treatment of the decorative parts:—Nos. 7*, 15*, 16, 19, 24*, 25, 31*, 32, 33*, 40*, and 44*: those with the asterisk attached being either of the highest class, or approximating nearest to the expenditure of 8,000*l.*"

The Committee, in their report, said:—

"That with regard to the undermentioned designs, viz.,—

No. 2.—Winged Circle	No. 21.—Spero
5.—Quello Questo	22.—Omnia Spero
7 & 3.—A Shield	23.—Sigma
8.—Utilitas firmitas	24.—Perseverance
9.—Scientia	25.—In memoriam (mediæval,
10.—Literature, Science, and Arts	27.—Silva
11.—Fit via vi	33.—Labore et honore
15.—Argonaut	36.—Utility
16.—Multum in parvo	37.—MDCCCLX
17.—Desideratum*	40.—Res non verba
18.—Volunteer	43.—In manus
19.—Comme ça	44.—Stella

the committee suggest to the Town Council that the designers should be at liberty to send in several guarantees from competent practical persons, and who will undertake to execute a contract to carry out their designs for an amount not exceeding the total sum of 8,000*l.* according to approved specifications, and that no such guarantee shall be entertained unless it shall be accompanied with the names of two responsible persons willing to be sureties for the performance of such contract."

After a long discussion it was resolved that the report should be printed and circulated, and the subject deferred till the next meeting of Council.

THE SEWAGE FOR THE SOIL.

MR. MECHI'S LECTURE.*

It must be a very strong practical conviction by which Mr. Alderman Mechi is actuated in the persevering—we had almost said the pertinacious—reiteration of his views as to the vast and national importance of the sewage of our towns to the soil of adjoining country districts. In this conviction, we need not now inform our readers, we heartily concur: the views we have long entertained on this subject are thoroughly well known. It cannot for an instant be supposed by any one who has well considered the whole subject, that our new sewerage system will settle this great question as regards even the metropolis: it will do no such thing; although it appears to be a step in advance, to which the extension of the metropolitan house drainage has driven the public, in their desperate efforts to get rid of the temporary nuisance thereby occasioned in the river and the sewers.

It was a strange and stupid proposal to get rid of that nuisance by reverting to the cesspool system, the permanent evils of which were precisely what forced the public into the extension of house drainage itself, as the half doing, at least, of a work which was essential to the public health. This half-doing, moreover, has had the further *merit*, we may truly say, of creating such a nuisance, in the meantime, that it has forced into notice the necessity of getting the other half of it done without delay; and the objections to the *status quo* are about as rational as those objections to "things half done" for which "fools and children" are so notorious in nursery tactics. True, the most long-headed scarcely see their way, as yet, to the full doing of the remaining half of the work, any better than the "fools and children;" but that there *is* a way, and that it *must* and *will* be found, the best informed have the utmost confidence.

Mr. Alderman Mechi's way, like that of his celebrated chymical friend, Baron Liebig, has been for some years before the public; and, so far as regards the mere abstract question of the propriety and advantage of returning the sewage to the soil, who can doubt that they are essentially right? The only question is how to get them together. In the first place "the stable mind" is not yet fully prepared for the advance from the stable to the sewer. "If the money value of the contents of our sewers," as Mr. Mechi remarks, "could be shown to the British farmer in bright and glittering heaps of sovereigns, he would grasp at the enormous wealth, and make great efforts to obtain it;" but, as it is, we "have not seen any practical desire or effort, on the part of British agriculture, to obtain this treasure"—in the dirty shape of sewage,—a shape, after all, not so "dirty" as that in which the glittering gold itself not unfrequently reaches the pockets of mere money-grubbers.

Then, again, comes the great and important question of liquid *versus* solid excreta. Mr. Mechi advocates for the liquid form of sewage, but he has not every one with him on that point. Well authenticated instances have occurred, both of late years in England, and for many years, as at Edinburgh, in which the diluted sewage of towns has been found to fertilize the soil to a luxuriant and almost *rank* extreme. But the most extensive experience is that of China, in which there are either no sewers, or at all events the excreta are removed from towns in the undiluted form, as is the case, too, at Paris. Mr. Mechi, however, states that the Parisian manure has been found too strong and wasteful in this form.

Another question, which we have not seen started, but which assuredly *will* come up, and perhaps at an inconvenient time, when it might damage the cause of the disposal of town manure over the soil of the country, and which had better therefore at once be started in a friendly spirit towards that end, is the question of the influence of crops reaped from human excreta upon human life and health themselves. It is well known that sheep will not continue to eat of grass produced from their own manure;—not only so, but that certain diseases arise in cases where they have been compelled to do so. It may fairly be asked, therefore, whether grain or other crops reared from town sewage be wholesome as human food: and, at all events, may not a prejudice arise, at a critical time, against the extensive use of town sewage, on the basis of such a question? In considering and discussing it, however, let it not be forgotten that there are divers ways of obviating evil, even though it be liable to occur, from the direct human consumption of grain crops manured by town sewage. Animal produce could be manufactured chiefly from it, and of course crops (besides grasses), to be consumed by such animals. It must also be remembered that in China, which teems with human life, a large proportion of the soil is manured with human excreta for the production of crops which are directly consumed as human food, and that for 3,000 years the land there has been cropped, but never exhausted, either in its own fertility, or in the human life sustained by it. We certainly know much less on this subject as regards China than we ought to know; and it is very desirable that every opportunity should be embraced, of access to the country, in adding to our knowledge of this interesting and important subject.

Another difficulty in the way of returning the sewage to the soil is, of course, the question of distance: districts in the vicinity of towns may readily be reached, however; and these districts may be found sufficient to absorb the whole of the sewage of the respective towns. But as regards the huge metropolis, still the question remains one of no little difficulty; and we are all well aware that one attempt to make use of its sewage in the vicinity was a failure, probably chiefly on account of this very vicinity itself. On this subject Mr. Mechi remarks:—

"Some years ago a company was formed to pump sewage from the Counter's Creek Sewer to the market gardens at Fulham. This was like 'carting coals to Newcastle,' for we all know that the soil, naturally very fertile, receives annually, per acre, from 50 to 100 loads of London stable dung, which is brought back free of cost for carriage by the carts that have taken the vegetables to London. It is on the poor soils, beyond this influence, that the water and sewage will be profitable."

In the very interesting and important lecture from which we have in this and previous instances quoted, Mr. Mechi gives, in support of his view, in favour of sewage as it flows from town sewers, in a diluted form, the following reasons—

"*Why the Sewage Form of Application is the most Profitable.*—Baron Liebig, in his last work, page 267, lays down this great principle, that 'the action of a manuring agent in a given time must increase in proportion as its surface increases.' Now you have, in town sewage, a perfect practical illustration of this principle. The food has been converted into its original elements by mastication and digestion, and it comes to your field dissolved by water and comminuted or separated by frictional action in the sewers. It sinks into the soil and sub-soil in the only condition in which its elements can be seized upon, and condensed on its surface, by each granule of a well-cultivated soil. Compare this with the clumsy dung-heap, where unseparated masses inaccessible to the soil show themselves for years, to the farmer's great loss, thus preventing the quick return so essential to farming profit."

These few desultory remarks, suggested by Mr. Mechi's lecture, we may appropriately conclude with two or three disjointed extracts from the lecture itself, chiefly as regards the difficulties connected with farmers and sewage companies:—

"Farmers, as a body, have no faith in liquid manure, and are not, probably, aware that twelve parts out of their own manure, and that of all their animals, is deposited as urine. The sheep-folding, deprived of its liquid, would be almost worthless. It appears to me that the only way to remove, or overcome, this difficulty will be for any company that may undertake the scheme, to show the effects of the town sewage on small plots of ground, in various parts of the country through which their pipes may pass, or otherwise offer such inducements for trials as may tend by their results gradually to remove this unprofitable prejudice. On sloping grounds below the reservoirs it might flow over the surface as in ordinary irrigated meadows, thus saving the farmer the expense of subterranean iron pipes. No one can reasonably doubt that the great want of British agriculture is more manure."

"Provided an abundant supply of town sewage were annually used, it would be impossible to exhaust the soil by any cropping: and our farm-leases might be a great deal shorter than they are at present. The generality of farms are now only manured once in four years. Such a system would suit farmers of limited capital. The only excuse for treading our straw under foot, and consuming our hay, straw, and green crops on the farm, is to produce manure to grow the cereals. It is quite clear that, as sewage manure contains *all* the elements of *every* crop that can be grown, we need no longer feed out oil-cake at a loss, or pay away our money for guano, bones, blood, and other manures."

"Until a change is effected in the agricultural mind, sewage companies, formed for its general distribution, must be great experiments. As such, they should, in the first instance, be encouraged, and even, probably, subsidized, by the towns, for the first few years, no charge being made to them for the sewage. In course of time, when the operation shall have resulted in good dividends to the shareholders, the sum to be paid to the towns might bear an equitable relation to the per centage of profit realized by the shareholders. Except by such an arrangement, capital will not be advanced for such companies, for it will take some years to convince Agriculture that she will be benefited by using and paying for town sewage. If landholders desire to prevent the exhaustion of their soil by the restoration of the sewage, they must give practical evidence of that desire, by taking shares in, or giving other facilities to, any public companies who will devote their capital to such an object. . . . Towns will derive a large revenue from their sewage; but that can only be when agriculturists have tested its value. In order to induce them to do this every temptation and encouragement must be offered to them, and to those companies who propose to supply them."

Last but not least in importance is what Mr. Mechi tells us of the actual practical and money profits of his system:—

"*Influence of Sewage Manure on my Farm Profits.*—I am much indebted to the sewage system on my farm in this respect—for the last six years my gain, as landlord and tenant, on my little farm of 170 acres, has been nearly 700*l.* per annum. Even this last year, with wheat at 42*s.* per quarter, I have gained 600*l.*, after paying every expense. Of course much of this benefit has arisen from steam power, drainage, deep cultivation, and other improvements; but the liquified manure system has greatly contributed to this result."

ROYAL SCOTTISH ACADEMY.—At a general meeting of the academy, held on Friday, Mr. John Ballantyne, one of the Associates, was elected to the degree of Academician.—*Edinburgh Courant.*

* "On the Sewage of Towns as it affects British Agriculture: read before the Central Farmers' Club, London, February 6th, 1860. By Mr. Alderman Mechi. With a Copious Appendix. London: printed by Jones and Causton, 47, Eastcheap, and 14, Pudding-lane. 1860."

ON THE CONSTRUCTION AND REBUILDING OF THE ITALIAN OPERA HOUSE, COVENT GARDEN.*

IT has been already stated that the works were commenced in the autumn of 1857. The removal of the old foundations was a work of great tediousness and difficulty, and as the day of opening was even then fixed for the 15th of May in the following year, all were most impatient to see the conclusion of the excavation, which, however, was so long delayed, that portions of the foundations were put in to save time long before the whole site was clear. The first brick was laid on the 23rd of September, 1857, but it was not until the end of October, in the same year, that the whole site was available for the energetic prosecution of the works. Almost all the iron-work, however, was ordered before the footings were completed, and the roof was, in consequence, furnished and ready for fixing before the building was more than three parts up.

Considering the unfavourable period of the year, and the risk of interruption to the bricklayers by rain, it was resolved to try to obviate this kind of delay, if possible. Messrs. Lucas, directly the matter was named to them, agreed to furnish all their men with complete suits of waterproof clothing, consisting of coat, leggings, and hood; and the men, while working on the walls in this black-hooded costume, reminded one of nothing so much as the story-book pictures of familiars of the Inquisition. It was soon found, however, that the walls, being built in mortar, could not be prudently carried up during severe rain, and the waterproof contrivances were, therefore, only used very occasionally. It will be seen that the arrangements for the auditory are quite independent of the external walls, and the boxes and corridors are, in fact, a separate structure of iron, stone, and wood, erected inside the chamber formed by the many walls of the building. For reasons already adverted to, it was resolved to use iron for this portion of the work; and it may be remarked that wrought iron has been adopted for almost all portions of the construction exposed to danger from fire and severe tensile strains, in consequence of its presumed advantages over cast iron in such cases. The boxes are supported by wrought-iron cantilevers, formed of two pieces of T iron $5 \times 5 \times \frac{1}{2}$. These are connected together with connecting web-plates, so as to form a double T, one piece serving as the upper flange, and half the web and the other constituting a lower flange and the completion of the web. A specimen beam was made before the works commenced, and carefully tested by actual weights before its application was resolved upon. The floor of the corridor is formed of 3-inch York landings, rubbed on both sides, which thereby form at small expense both floor and ceiling. They are supported on rolled iron joists, connecting together the cantilevers, before described, which are strongly let into the wall of the corridors, and have a point of support distant rather more than half their length on cast-iron columns placed at the backs of the boxes. The columns are eighty in number, in sets of four, resting on each other, being carried up from the basement. In consequence of the necessity for the cantilevers to pass through the columns at the points of support, the top of each column is formed into a species of box, through which the cantilevers pass, and to which they are safely secured. It will be seen that as the columns rest on each other they cannot yield to superincumbent weights unless their foundations give way. It was, therefore, felt to be a difficulty that, while the walls would certainly settle (especially when carried up so rapidly), the columns by remaining rigid and unyielding would probably cause serious inconvenience, and might, by altering the levels of the cantilevers and beams, expose them to aggravated cross strains. To obviate this danger, it was resolved not to fix the iron work until the walls were carried up, so as to give as much time as could be afforded to allow them to settle. It was also determined to make the boxes forming the heads of the columns rather deeper than was necessary. The bearing was then brought up to the right height by their filling in pieces of sheet-iron, any number of which might be easily withdrawn in the event of the walls settling, and requiring a corresponding lowering of the beams and cantilevers. It is satisfactory to add that these precautions have never been called into play since the ironwork was fixed, nor has any settlement occurred, as far as I know, since the completion of the building. The number of bricklayers for some weeks exceeded a hundred, and the number of workmen of all classes varied from a small body at the commencement to as many as 1,200 during the last few weeks of the works. The joiner's work was prepared at Messrs. Lucas's works, at Lowestoft; and all the principal portions of it were put in hand at the same time that the brickwork was commenced, and all difficult parts were carefully put together on the premises, then and there carefully taken down, marked, and sent to London. Thus the ceiling over the pit, the combined curves of which needed some care to ensure accuracy, was put together and temporarily supported in Messrs. Lucas's yard many weeks before the building was ready to receive it. Owing to the limited space occupied by the building, the site of the Floral Hall being still encumbered by ruins which there had been no time to clear away, much difficulty was experienced in finding room for the large quantities of materials daily required; and when the time came for delivering the great roof girders, 96 feet long, 9 feet deep, and weighing 17 tons each, it became necessary to hire a wharf on which they might be stored until they could be received and fixed. The girders were divided into halves for convenience of transit, and in that form were eventually brought to the works. Considering that the walls, 85 feet high, had been carried up in thirteen weeks, and during an unfavourable time of year, precautions were thought necessary to ensure, as far as possible, an even distribution of weight upon them, which was rendered the more necessary from the fact that, owing to the peculiar construction of the roof before adverted to, the main girders had not only to carry their own weight and the weight of the roof, but were also required to support the ceiling of the auditory, the scenic arrangements over the stage, and a complete story of workshops. In the old theatre Sir R. Smirke had effectually provided for distribution of weight by placing two wall plates of nearly whole timber dimensions along the walls; but with an iron construction this resource was of course unavailable, while the iron girder was not only heavier than the wooden truss, but was also nearly one-half further apart from its neighbour, thus adding in every way to the necessity for precaution from the greater concentration of weight on certain points. The mode adopted was, instead of using wall plates of wood, to carry up twelve courses in cement and hoop iron, forming thereby a wall plate of brick and cement. This 3 feet of wall was connected with the external and cross wall by iron ties similar in character to those before described, and from it six more courses, also in cement, were carried up to the underside of the templates which receive the main beams. These are of stone, 4 feet by 3 feet 9 inches, and upon them are fixed cast-iron plates, 2 inches thick, carefully fitted to the shape of the lower flange of the beams. These iron plates were found very useful in fixing the beams in their places, as will be seen presently. The operation of hoisting and fixing the main roof girders was a matter of some difficulty, and several modes of accomplishing it were considered. It may, perhaps, be interesting to describe shortly the manner in which these great metallic principals, each weighing 17 tons, or more than the unfortunate Big Ben of Westminster, were safely fixed in their places. It was felt that, considering the greenness of the walls, and the absence of cross walls, a sudden blow, from any accident in hoisting the girders, might be attended with very serious consequences. Moreover, the length of the girders being 96 feet, and the space between the walls only 90 feet, it was obvious that they could only be hoisted in an oblique position if raised whole, and such a course would entail great difficulties in getting them into their permanent places, on the top of the building. It was consequently determined to raise them in two pieces, in which condition they came to the works as before stated, and to rivet them together on the top of the building. In a central position, where the Proscenium now stands, a scaffold, about 30 feet by 20 feet, was raised, and floored over at the same level as the top of the walls. The half girders were then raised and placed temporarily, so that the two ends rested on the walls, and the divided centre portions were supported on the scaffold, which resembled a gigantic table. Small portable forges were then supplied on the scaffold, and the half girders were riveted together in the position described, the whole operation taking about three days to effect. The girder then required to be moved to its place, and room made for the others. Great caution was used in moving the girders, in order to avoid exposing them to any severe cross strains, which by deranging their parts might materially injure them. It was necessary, therefore, that the girders should be moved, evenly and easily, both for their own sakes, and by reason of the state of the walls. To effect this a whole timber was laid upon the walls, longitudinally, and an iron rail fixed on the top of the same. Carriages, with flanged wheels running on the rails, were placed under each end of the girder, and a very moderate force applied to the carriages, caused the great mass to move along the walls with the ease and smoothness required. As soon as a girder was moved from the scaffold another took its place, and before the latter was riveted, a third was hoisted, ready to occupy the scaffold as soon as vacant. Thus the three operations of fixing, riveting, and hoisting, were all pursued together by different gangs of men. We have now accompanied the girder to its place, but we have not yet seen it placed in its permanent resting-place, to do which without a jar to the walls, and with perfect accuracy, was an operation requiring some delicacy. As the whole roof is so connected together, both with floor beams and roof principals, all of which were made at the same time as the girders, and were fitted to them to the 1-20th of an inch, any, even trifling, inaccuracy in fixing the girders would have produced serious difficulties. The iron bedplates under the ends of the girders were therefore fixed in the stone templates with great care; they were provided with a hole through them, under the centre of the girders tapped for a 2-in. screw, and a corresponding hole was drilled through the stone template. Several courses of the brickwork under the stone template were also temporarily left out. The screw was then introduced from below, and passed through the carriage under the end of the girder, which was carefully adjusted, directly over the screw. The carriages were then removed, and the girders left resting upon the screws, which were then slowly withdrawn from below, and the girder finally lowered to its resting-place. The omitted brickwork was then made good, and the fixing was complete as far as the main girders were concerned. Care was taken not to surround the ends of the girders with brickwork, but to have them free and susceptible of being painted from time to time. The small intermediate roofs, having been all prepared before, were next fixed with great rapidity, and the roofs at the ends of the building were slated and covered in before the girders for the middle portion were even hoisted,—the whole operation of hoisting and fixing the girders having taken only three weeks. The floor-beams between the girders over the auditory were likewise soon in their places: they are made of wrought-iron, and carry the floor of the workshops and the ceiling of the theatre. The chandelier is supported by two iron beams supported at each end by the main trellis girders. It is worked by a crab, and can be raised partially into the workshops, or lowered to the floor of the pit. As soon as the floor was completed, as described, the internal works of the building were pushed forward as much as possible, and the interior of the auditory, which was at present only in carcass, began soon to assume its present shape. It being naturally of the greatest importance to employ as many hands as possible, it was decided not to allow any scaffold to be erected from the ground, but to construct the ceiling from a platform suspended from the iron beams of the roof and the floor in the same. The platform was constructed in the following manner:—Rods of wrought-iron, 1 inch in diameter, were hung down from the beams above, where the aperture, in the centre of the ceiling, would ultimately be formed. From this point, timber beams, or joists, radiated like the spokes of a wheel, each beam or spoke being supported at one end by one of the iron rods above alluded to, and the other end being carried by a rope strongly fixed to the beams of the floor above. These radiating beams, thus constructed, formed the supports of a platform on which the necessary scaffold was erected for the fixing and completion of the ceiling. The latter is covered with Bielefeld's fibrous slab, which has been extensively used at the British Museum. It was fixed in large slabs, about 12 feet by 6 feet, and is $\frac{1}{4}$ inch thick. Of course, in covering the ceiling, it became necessary to shift the ropes supporting the scaffold to such positions as would not interfere with the decoration, or cause unsightly holes to be made through the slabs. Provision was accordingly made for the existence of some holes in the ceiling, through which the ropes might pass, not only during the progress of the work, but also at any future time when repairs or redecoration might be necessary. The holes, twenty-four in number, are placed at

* By Mr. E. M. Barry. See page 85.

the joints of the fibrous slabs, and are concealed in the finished ceiling by plugs let down and removable from the floor above, so that ropes may be at any time lowered through them, and a scaffold formed with facility, and at slight expense, whenever required. The form of the ceiling is as follows:—Over the pit is a flat dome, 65 feet 1 inch diameter, and 7 feet 2 inches high: this rests upon four elliptical arches, 63 feet 7 inches span, with pendentives. The ceiling over the main gallery is flat, and the two side galleries or steps are covered with arched ceilings, following the shape of the elliptical arches supporting the dome. The dome is formed of purlieus in two thicknesses, circular in plan, and hung down from the floor above by wrought-iron rods. The purlieus carry ceiling joists in the ordinary manner. The arch nearest to the stage is 10 feet from the curtain, to allow of the formation of a sound reflector over the foot-lights and the projecting piece of the stage from which the principal *artistes* commonly sing. The reflector is curved, and follows the form of a parabola. It displays for its ornamentation a bas-relief, designed by Signor Monti, representing the ancient and modern drama, with a likeness of her Majesty in profile between the two subjects. The box-fronts were also designed by the same artist, and are executed in the new combination of canvas and plaster, which Mr. Owen Jones has largely used, and has lately introduced to the notice of this Institute.

The decorations of the interior were for the most part carried out under the personal directions of Mr. Gye, assisted by Signor Monti, only a small portion of the original designs for this portion of the work having been carried into effect. The whole of the operations connected with the ceiling, such as fixing the carpenters' work, fixing and painting the fibrous slab, and fastening the enrichments in their places, were carried on from the suspended scaffold, and during this time the works below were being pushed on with all despatch. The foundation walls under the pit were built, the iron columns and cantilevers for the boxes were fixed, and carpenters, masons, smiths, painters, decorators, and gilders, jostled each other. Indeed, the interior of the theatre at this time presented an epitome of the building trade, almost every handicraft having its numerous representatives, while the placards in the streets, announcing in large letters the 15th of May as the day of opening, were calculated to cause all concerned the greatest anxiety. In designing the construction of the floor to the pit, a question arose which determined its general character. With a view to render the theatre applicable to all possible purposes, it appeared to be an advantage to possess the power of raising or lowering the floor if required. On such occasions as public dinners, *bals masqués*, &c., it is obvious that such a facility might prove very advantageous. It was accordingly resolved to support the floor on trussed timber beams, 2 feet 3 inches deep, resting on cast-iron columns. These columns have split heads, resembling a musician's tuning-fork. By the adoption of this form, the trussed floor-beams can be lowered into the columns their own depth, whenever required, a number of packing-pieces filling up the cavity in the top of the column if it be desired to retain the beams at any particular height. An instance of the convenience of being able to alter the position of the pit floor was shown soon after the opening of the house. From some misconception, the stage had been fixed 9 inches too high, and the occupants of the front rows of stalls had an impaired view of the performers in consequence. During the recess, the front portion of the pit floor was raised 9 inches, so as to occupy its proper relative position to the stage, and the inconvenience was at once obviated. While the works above described were in progress the stage was in active preparation. Mr. Beverley, the distinguished artist, was consulted as to its general arrangement and mode of working, and the practical realization of his views was confided to the experienced hands of Mr. Sloman, who has been so long connected with the theatre, and whose reputation in such matters is so well established. The proscenium columns are arranged to slide on wheels, so as to expand or contract the opening when desired. The grooves so commonly used for the support of the scenes are entirely done away with, it being considered that their undoubted convenience is more than counterbalanced by their attendant disadvantages, and more particularly by the obstacles they afford to the formation of a grand open scene embracing the whole extent of the stage. The back scenes are of single sheets of canvas, lowered from the top, and secured to rollers resting ultimately upon the main beams of the roof. The side scenes and set pieces are fixed to the wing ladders behind which the side gas-lights for lighting the stage are placed. The wing ladders being unattached to anything above, the artist is enabled to place large set-pieces, such as trees, rocks, houses, &c., against them and still preserve the total height of the stage, while they are so constructed that they may be moved completely across the stage. The upper pieces of scenery, known technically as borders, are of somewhat novel construction. Owing to the great size of the stage, it was desired to possess the power of using it to its greatest width, especially for out-door scenes, and I may perhaps mention some of the scenery in "Dinorah" as instances of how admirably Mr. Beverley can use his opportunities; but borders to suit such extended scenes would be useless for those of a more limited description, and to avoid the necessity for a double set of scenes, it was resolved to make the borders in three pieces—a centre and two wings; the latter being so arranged as to slide forward and back, so as to form an arch of any required diameter. There are two sets of flies, each 8 feet wide, from which the machinery is worked, and there are recesses on each side of the stage to receive the scenery not in use. One of these recesses is occupied by a powerful organ, often used as an auxiliary in operatic performances.

The painting-room occupies the ordinary position at the back of the stage; but as the floor is carried by a trellis girder of the same description as those supporting the roof, the stage is enabled to extend entirely under the painting-room without interruption from walls or columns. The painting-room is 90 feet long by 30 feet wide, and 50 feet high in its highest part. It contains several painting frames of different sizes, hung in pulleys, fixed to the walls, and furnished with counter-balance weights. The frames are contrived to slide downwards through the floor, so that the artist can readily gain access to any part of the canvas he may desire, without leaving the floor of the painting-room. There is a large sky-light in the roof, and the floor is furnished with traps to admit of moving scenery to or from the stage below. The scenes being necessarily often of very large size, owing to the great dimensions of the stage, slits are provided in the stage floor under those already described in the floor of the painting-room, so that the scenes may be lowered even as far as the basement, if required. Under the floor of the painting-room are fixed the contrivances for simulating the noise of thunder, rain, and the like; and the great bell, whose mournful notes have sounded the knell of so many a disconsolate tenor, is fixed in the same position. The new theatre being intended to be used principally in summer, it was not considered necessary to do much in the way of warming, as far as the opera season was concerned; but with a view to its occupation in the winter, as is now, in fact, the case, some artificial means of warmth were, nevertheless, required. A chamber is consequently placed under the pit, sufficiently low to admit of the lowering operation before described, in which hot-water pipes, heated from an apparatus under the grand staircase, are fixed: an air-grating round the pit, allows the heated air to escape into the house. The principal exit for the heated and vitiated air is through the aperture, 10 feet wide, over the chandelier; above which there are openings into the external atmosphere. There are air-valves to the boxes over the doors, and a number of small holes are drilled in the risers of the gallery seats, giving a passage for the air from the halls and corridors to the chandelier, but not in sufficient quantities at any one place to create a draught. There are also air-flues in the corridors and in the crush-room, to carry off the products of combustion from the numerous gas-lights; and there are outlets into the roof from the side galleries. None but these simple expedients for ventilation are adopted, experience having, I think, shown that most elaborate systems of ventilation are liable to failures, more or less complete, in proportion to their greater or less elaboration. A copious supply of water is of course one of the first essentials in a theatre, as a precaution against fire; for it is clear that, if a fire is to be resisted successfully, it must be so within the first quarter of an hour, as after that time the body of flame would be so vast as to defy all control. The precautions sometimes provided of iron curtains, and the like, are of questionable value, as when most wanted they are seldom available, or in order; and the only valid precaution appears to be to provide plenty of cocks, with a high pressure water supply, in all parts of the building. At Covent-garden there are twenty-five of these cocks, supplied from cisterns in the roof, capable of containing 12,000 gallons. The main cistern is placed over the stage stair, in the north-west corner, towards Hart-street; and, in order to secure a constant supply in case of fire, the cistern is divided into two unequal parts, the smaller of which supplies the closets, sinks, and taps, of the house, while the larger is entirely reserved for the supply of the fire-cocks, at high pressure. The supply to the cistern is so arranged that not a drop of water can find its way into the smaller compartment until the larger is full to overflowing. As long, therefore, as there is any water in the closets, &c., it is certain that the fire-cocks are charged; and if by any chance the supply should run short, the inconveniences would be at once felt and remedied. It may possibly be remembered, that when the theatre was opened to the public on the 15th May, 1858, the tympanum of the portico was not built, and the removal of the scaffold at this part of the building was not completed until the afternoon of the opening day. It had been intended not to have attempted the erection of the portico until the next year, but considering the inconvenience and interruption to the business of the theatre that might be expected by a renewal of the works at the principal entrance, Messrs. Lucas were asked, as late as March, 1858, whether they would then undertake to erect the portico, the columns of which are 36 feet high, and 38 inches diameter, before the 15th May, leaving the tympanum only to be added afterwards. This they consented to do; and on the 27th March the order was given to proceed. On the 22nd April the last capital was set, and the last stone of the architrave was fixed complete on the 8th May, just one week before the opening of the theatre, although the ground at the theatre was now so crowded that every stone had to be worked at the wharf in Lambeth.

The satisfaction, however, of all concerned in the erection of this work was damped by a very sad occurrence. The mason (Mr. Caiger) in charge of the work under the contractor's principal foreman of masons (Mr. Hatfield) met with his death on the very day of the completion of his work. He had been promised a present contingent upon his exertions being crowned with success, and after setting the last stone, was stepping back to contemplate his work with natural satisfaction, when he took one step beyond the scaffold, from which he fell in an instant and met his death on the spot. Looking to the unavoidable dangers of building and other peaceful occupations, I am not sure that we always do justice to the courage and determination so eminently displayed by our artisans, or always sufficiently remember the sacrifices and sufferings by which the battles of science are won.

After the portico was completed, iron beams were fixed over the space between the front wall and the colonnade, a beam being placed across each column. At the close of the season a platform of scaffolding was formed upon the iron beams, and the tympanum carried up entirely from the same; the space thus formed being converted into a practising room, 74 feet by 14 feet, over the portico, and entered from the back of the theatre gallery.

In fitting up the interior of the auditory it was resolved to allow to each spectator a more liberal share of room than had formerly been the case, and the consequence of course is that the actual number of persons accommodated suffers a corresponding diminution. When the theatre is used for the opera, the number of spectators, comfortably seated, amounts to 2,300; but when otherwise fitted, 3,000 or more visitors can be easily accommodated.

There were many sub-contractors employed by Messrs. Lucas for various parts of the work, and all exhibited the most praiseworthy anxiety to complete their work, and enable faith to be kept with the public by opening the theatre on the day named from the commencement. Where all did well, I feel a selection might seem invidious, and as the names of all concerned were published in the *Builder*, I shall not do more here than allude to the clerks of works, Messrs. Allen and Miller, and the foreman of Messrs. Lucas in charge of the works, Mr. Clemence, whose zeal and ability, evinced under most trying circumstances, deserve special recognition. With this I propose to close my description, and hope the Institute will excuse me, if I have trespassed too long upon their attention.

WEYMOUTH TOWN SURVEYOR.—We have received some animadversions on the town council of Weymouth, in respect of their views as to this appointment, but we cannot deal with men's motives on mere assertion.

THE BUDGET.

The proposed treaty with France, and alteration in home taxes, if confirmed, will give a great stimulus to many branches of trade. Our iron masters, machine-makers, and makers of pottery, will at once find new markets of the most extensive kind. Many will remember the anxiety that was shown in France on the occasion of the international exhibition to obtain the cheap wares of Minton, Copeland, and others.

The reduction of the timber duties will promote activity. The duties it is proposed shall stand:—

Timber, or wood, not being deals, battens, boards, staves, handspikes, oars, lathwood, or other timber, or wood sawn, split, or otherwise dressed, except hewn, and not being timber, or wood otherwise charged with duty, the load of 50 cubic feet	0	1	0
Of and from British possessions ..... the load of 50 cubic feet	0	1	0
Deals, battens, boards, or other timber, or wood sawn, or split, and not otherwise charged with duty, the load of 50 cubic feet	0	2	0
Of and from British possessions ..... the load of 50 cubic feet	0	2	0
Planed, or otherwise dressed, or prepared for use, and not particularly enumerated, or otherwise charged with duty, for every 100*l.* value	5	0	0
Of and from British possessions, for every 100*l.* value	5	0	0

A more important change still, however, will be worked by the proposal made in the following words:—

"That on and after the 1st of July, 1860, all duties of excise on paper, button-board, mill-board, paste-board, and scale-board, made in the United Kingdom, and all drawbacks and allowances in respect thereof, shall cease and be repealed."

This tax has long been a blot on our intelligence. We have taxed ourselves, on one hand, to assist the spread of education, and we imposed a tax, on the other, to cramp these endeavours and limit the extension.

ARCHITECTURAL PHOTOGRAPHIC ASSOCIATION.

We have already classified the 505 photographs now in the Conduit-street Gallery as waiting selection on the part of the members of the association, the object of which is, as set forth by the committee:—

"1. To procure and supply to subscribers photographs of architectural works of all countries.

2. To form a collection of such photographs for the association.

3. And in any other manner to render the art of photography serviceable to the promotion of the knowledge of architecture, and to the requirements of the profession."

The specimens are marked with a numerical value as on previous occasions, and subscribers are able to select any subjects, of which the values, added together, shall not exceed 50; and for every 5 beyond, a small sum is payable in addition. Thus, of Mr. Fenton's English views, and these are amongst the best, the numerical value of each, mounted, being 18, three may be had for each guinea's subscription. The "West Porch of Lichfield Cathedral" (303) is an admirable specimen. Many of the English views are exceedingly good. Mr. Melhuish's, for example, "The West End of Tintern Abbey" (319), and "The West Doorway of Rochester Cathedral" (325), in particular. Mr. Bedford, too, has several capital photographs. Amongst these we must point to one which is very remarkable if examined with a strong glass (475), the photograph of the celebrated monumental brass of Bishop Burchardus De Serken" (1317), and "John de Mül" (1350) in the Cathedral at Lubeck, made from a rubbing by Mr. John Christopher. The original is 12 ft. long by 6 ft. 1¾ in. wide. Amongst Mr. Cocke's specimens (366) should be be looked at, "Durham, from the River," for, being by the instantaneous process, the ripple is exhibited in a way we have never before seen.

Going to France, Bisson has an admirable set: notice for example (50) "The Western Portal of Rouen Cathedral."

The views of Jerusalem, by Robertson and Beats, appear to be new, and this cannot be said of all the collection. 115, "Part of Old Walls of the Temple," the "Wailing Place" of the Jews; and (116) "A general view from Mount Scopus," are particularly interesting. Professor Donaldson has already given sufficient praise to the specimens from Rome, indeed so much so that one correspondent "E. R." has addressed a communication to us, accusing the Professor, good-temperedly, of making his lecture on photography a cover to an attack on mediæval in favour of classical styles.

The photographs by Ponti, from North Italy, although of very interesting subjects, are neither so good in colour, nor so true in focus, as they might be. We need not tell those who have read the observations we have made at different times on the subject, that the Architectural Photographic Association is not yet thoroughly carrying out what we believe to be its mission; but we may, nevertheless, safely commend the present exhibition to notice as an interesting collection, offering for selection, at a small cost, some valuable subjects.

Mr. Lightly, who is acting as honorary secretary, or Mr. Moody, the curator, will give any information that may be desired.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE GOLD MEDAL.

A special general meeting of the members was held on Monday evening, the 13th instant, Mr. C. R. Cockerell, R.A., president, in the chair, to take into consideration the recommendation of the council with respect to the award of the Royal Medal, the silver medals, and other prizes of the Institute for the year 1859; and their recommendation with reference to the medals for the year 1860.

The council recommended that the Royal Gold Medal be presented (provided the sanction of her Majesty be obtained) to Mr. Sydney Smirke, R.A. The recommendation of the council was unanimously adopted.

The report of the council stated that two essays and one set of drawings had been received in competition for the Medal of the Institute and the Soane Medallion. One of the essays, signed "Hope," was on the genius of Vanbrugh; the second, inscribed, "He that hewed wood afore, out of the thick trees, was known to bring it to an excellent work" (Ps. lxxiv., 6), on woodwork of the Mediæval period. The latter was accompanied by a remarkable series of pen-and-ink sketches. While admitting the excellence of the sketches, the council expressed regret that the incompleteness of the essay, apparently from want of time, prevented them from recommending the award of the Institute Medal to the author of it, and suggested some honorary acknowledgment. After considerable discussion, and an amendment to the effect that the Institute Medal be awarded to the author of the essay (which was lost), a Medal of Merit was voted.

On opening the letter accompanying the essay it was found to be by Mr. G. E. Street.

For the other essay and the design no award was made.

The subjects for which essays and drawings are to be invited were settled, and will be duly advertised.

Mr. C. Fowler, Mr. Kerr, Mr. Godwin, Mr. Papworth, Mr. Rowe, Mr. John Billings, Mr. Jennings, Mr. Mylne, Mr. Morris, Mr. Williams, Mr. Roumieu, Mr. C. C. Nelson, Mr. Sancton Wood, Mr. Haywood, Mr. Marrable, and others, took part in the discussion.

CERAMIC WOOD.

Mr. J. C. Martin, of Barnes, has patented a plastic material, resembling wood in its finished state. It may readily be moulded by pressure into moulds of any form: it admits of carving or cutting to any extent required; may with facility be glass-papered; and will receive the highest French polish.

The material is in great part composed of fibrous pulp of as long a description as possible (to which it owes its strength), which is worked together with resinous and gelatinous gums, acted upon chemically, and as nearly to imitate the nature of wood as possible.

The inventor says,—"It is unlike all the ordinary descriptions of moulded papier maché or carton pierre, as it contains no earthy or non-fibrous substance in order that it may be made to take a fine impression, and to this it in a great measure owes its strength and the facility with which it may be carved and finished, and renders it suitable for the manufacture of many articles to which other descriptions of plastic materials could not be applied; and, at the same time, from articles made from it being homogeneous throughout, they do not chip with a blow, as is the case with ordinary moulded ornamented papier maché articles, which are faced over with a weak, readily-moulded material, in order to take an impression."

It was while engaged in experimenting with various woods, with a view to their conversion into pulp for the manufacture of paper, that it occurred to Mr. Martin to replace the pulp and the gums of which the wood had been deprived, varying the proportions to meet the circumstances, and upon this the invention is based.

When the duty is taken off paper, as it probably will be shortly, we shall hope to see some fresh material for its manufacture hit upon, or the consumer will probably benefit less than should be the case.

ENAMELLED PIPES AND UTENSILS.

The improvement of the sanitary condition of large towns, and the best and most economical means for effecting so desirable an object as the preservation of the public health, are questions for the grave attention of those to whom the interests and social comfort of the rate-paying public are delegated. Various plans for conveying pure water from reservoirs through towns and into dwellings have been tried with more or less success. As bearing on this, we notice an invention, which has been patented by Mr. Paris, for the purpose of avoiding the evils arising from poison in water conducted through lead pipes, and the impurities which are constantly accumulating in iron ones; and also the breakages to which earthenware tubes, otherwise desirable for this purpose, are liable. The invention consists in the preparation of a fused glass, or enamel, applied to the surface (externally and internally) of iron tubes, which are thus encased. The enamel is incorporated with the iron while it is at nearly a white heat. Messrs. Allsopp & Sons, the brewers, we are informed, have adopted these enamelled tubes for conveying their water, for brewing, throughout the whole of their new premises at Burton-on-Trent. The invention is also applied as a coating for the surface of vessels used for culinary and other domestic purposes. As a substitute for earthenware for the use of prisons, public asylums, and workhouses, it is urged that it has advantages. The works for the manufacture of this article are carried on by the Patent Enamel Company at Birmingham.

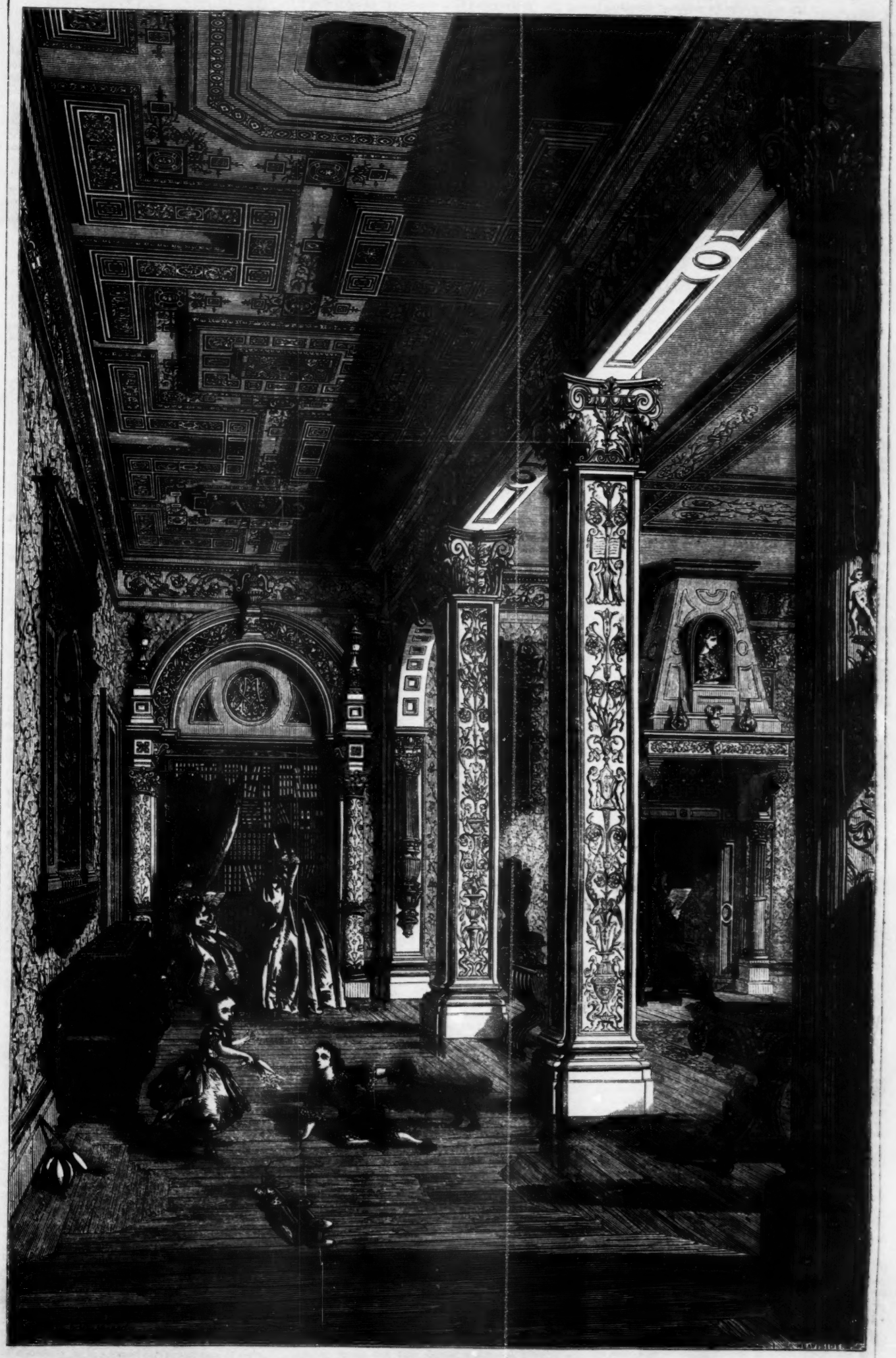
THE MORNING-ROOM AT ASHRIDGE PARK.

Ashridge Park, in Buckinghamshire, near Great Berkhampstead, the principal seat of the Right Hon. the Earl Brownlow, has engaged the best talents of three generations of architectural Wyatts. The mansion, originally built by James Wyatt (the Surveyor General), for the Earl of Bridgewater, was probably (after Fonthill) the most imposing, both for extent and elaboration, of all the series of florid Gothic houses on which that active artist was engaged. In common with almost all his other works, the original structure evidences that vivid perception of picturesque effect, both internally and externally, in which James Wyatt was generally regarded as excelling all his contemporaries. Nor, indeed, are the details by any means as poor and frittered as those he introduced in Mr. Barrett's "Priory" at Lee, in Kent,—the building on which the most prosperous change in the current of his fortunes was based.

Jeffrey Wyatt, the nephew, was called in to make various additions to his uncle's work, and has not failed to vindicate his superior knowledge, and to exhibit, at the same time, his inferior imagination.

Their descendant, Mr. Digby Wyatt, in the elaborate apartment which forms the subject of our engraving, has proved himself a not unworthy scion of the house. The Renaissance style was, no doubt, selected, in this instance, in preference to that in which the rest of the house is built, from the circumstance of the apartments being especially destined to receive and display many very beautiful and interesting works of art of the Cinque-cento period, collected in Italy by the Lady Marian Alford—the mother of Lord Brownlow, and the accomplished daughter of one of the most accomplished noblemen (the late Marquis of Northampton) who has ever graced the English peerage. Herself a highly cultivated artist, she has brought the control of a refined and highly critical judgment to the aid of Mr. Digby Wyatt in the successful carrying out of his design, and the result has been the production of the work of art of which we now place a representation before our readers.

The whole of the working and full-size drawings, for the elaborate details which give animation to this composition, were made by the architect himself: the modelling was executed in Paris, by Mr. Desachy and his assistants; and the reproduction at Ashridge, by Mr. Parsons, of Acton-street, Gray's Inn-road. The work was superintended with great zeal and care, by Mr. Shelbourn, Clerk of the Works to the magnificent estates, which, it may be remembered, formed the great prize in the celebrated law-suit between the Custs and the Egertons, of Tatton.



THE MORNING-ROOM AT ASHRIDGE PARK, BUCKINGHAMSHIRE.—MR. DIGBY WYATT, ARCHITECT.

ARCHITECTURAL UNIFORMITY.

THE ARCHITECTURAL MUSEUM.

On the 8th instant, Mr. W. White delivered a lecture in the Theatre of the Museum at Brompton, on "Architectural Uniformity and its Claims." In the course of it the lecturer said:—

In an architectural subject of this sort, the most attractive and the most practical points are those that relate to the difficulties which have to be encountered, and to the arguments which have to be met by all such as value, or aim at carrying out, correct principles in architectural design. Research into this subject being of peculiar interest and value to myself, my desire is to interest others also in the same research, feeling sure that a thorough discussion of the question will be very beneficial at the present day, when some persons—knowing the value of uniformity and insisting upon its universal application in architecture—will sacrifice fitness and convenience, rather than violate their favourite principle; whilst others, on the contrary, having witnessed the misuse and abuse of uniformity, and dreading a recurrence of what the last century produced, take a pride in setting uniformity at naught, despising and denouncing it, as worthy only of the most inferior and commonplace work. At the present day, however, we have more to fear from the neglect and lack than from the excess of uniformity. A revulsion from the stilted uniformity of the last century has set in, and the reaction seems likely—not merely to carry men beyond the bounds of a fitting irregularity and diversity into an extravagant crookedness and quaintness, but—to lead them to view in a wrong light the very nature and purpose of uniformity, as an element of architectural beauty. There are many, indeed, who take up the subject as an essential branch of the great question at issue between the Classicists and the Gothic Revivalists, as though the presence or absence of uniformity constituted one of the chief characteristics of the Classic and of the Gothic schools respectively, and as though uniformity, and irregularity or diversity, were opposed to each other, in regard of preference or dislike, of right or of wrong. There is, however, so far as style is concerned, but little, if any, abstract right or wrong in the adoption of either. Both, in fact, are alike needed—both are equally indispensable in many cases; but in every case the uniformity, on the contrary, mainly depends upon the particular circumstances of the individual instance. Inquiry into such circumstances must form one considerable portion of our subject.

The subject itself is divisible into three main heads. There is, first, Uniformity of Feature; second, Uniformity of Type; third, Uniformity of Style. But it is to uniformity of feature that I wish exclusively to confine your attention. Not because there is nothing of interest or of consequence to be said under the other heads, but because it is to feature rather than to type or to style that the very term uniformity primarily and literally applies, and because there is even in this more than would suffice to occupy our time and to take our whole attention.

Of uniformity of feature, then, there are several distinct branches, of which some of the chief are the following. There is, first, the equal balance and correspondence of such particular features in an edifice as hold the same relative position to some central line or feature, or to each other. There is, again, the general similarity and correspondence of features in such different parts and position of the same work as do not come into immediate contact with each other, but are so separate, perhaps, as to be not in sight at the same time; or, in other words, general uniformity of detail. And there is the oneness and regularity of form and general outline which commonly characterises a simple building on a large scale. The uniformity or balance of particular features is one of the first and most palpable characteristics, which forces itself even upon the untutored eye in any object which is capable of correspondence or balance of parts.

That the love of this uniformity really is inherent in human nature is evident, from the universal application of the old simile of the one-eared pig to any form exhibiting a gross violation of this principle. The saying refers us, it is true, to a most unpoetical, unartistic, and unbeautiful animal; but who has not felt the force of this simple similie, applying, as it does, to the noble and the ignoble alike, and gaining point, as it were, by its very application to that which, by common consent, is to be regarded more as useful than ornamental? And hence it is evident that, even in the form of objects for inferior use, uniformity is not to be despised; for, seeing that that which possesses so very little to commend itself to our notice is disfigured by so slight a mutilation, the nature, as well as the extent of the fault, must be very great. It is this extreme sensibility to, and love of, absolute uniformity, which has led to the wholesale introduction of blank windows, and other sham features, in our national architecture. The fine feeling for that which is in itself good has been thus drawn to that which is subversive of all that is good in architectural design. The very craving after perfection has led man unwittingly to the greater imperfection, and perfection in kind has been rudely sacrificed to that which was imperfect only in degree. Yet let me not be supposed to urge that every species of pretence or sham is wholly and utterly to be condemned and repudiated. Every sham feature is a sign of serious defect or imperfection; but there may be particular instances in which a certain amount of imitation, or a forced striving after uniformity, is fairly and properly allowable. These instances are, and ought to be, exceedingly rare,—as rare, one may almost say, as is a glass eye or a cork leg; a substitute to conceal a painful imperfection, and not a voluntary and deliberate treatment of what possibly can be made up by other and more legitimate means, or in a more truthful manner. Hence the perpetration of a sham is less admissible in a new work than in an old one. In a new work there is, as it were, full scope to do anything, without regard to the restraints and imperfection so often obvious in an old building, of which the best that circumstances allow has to be made. In a new building there can rarely be any good reason for contriving an outline which involves the necessity of having recourse to despicable and mean expedients for making a feature appear what it is not; and every sham in a new work shows a want of power in the original design, but an old building may bear upon its face sufficient marks of alteration or ill-treatment, or perhaps also of changed requirement, to justify what might be otherwise inexcusable, whether in the absence of uniformity, or in a forced correspondence of parts.

But howsoever this may be with reference to such exceptional cases, it is evident that, in a general way at least, this kind of uniformity may be regarded as the type of perfection, as irregularity is of imperfection: and hence we may take it as a rule, that uniformity is to be aimed at whenever there is no sufficient cause to the contrary. What constitutes sufficient cause to the contrary remains, therefore, in the next place, to be pointed out.

Architectural uniformity is but one element of beauty amongst the many that help to make up a perfect whole; and, as we have just seen, the principle of uniformity ought to be followed in architectural design; but in practice the exceptions to this principle are so numerous as to make irregularity, at first sight, almost appear to be the rule. In small buildings, of varied requirement, this is especially the case. In large buildings, and buildings that aim at greater dignity and perfection, the exceptions to uniformity will be proportionably rare. In our architectural undertakings we seldom or never have our choice free and unlimited, as to what shall or shall not be the general treatment of a design. Certain requirements and necessities of the case generally suggest what it shall be, in regard especially of size and of relative importance or pretence; and, if the requirements or the means are small, our aim must be small too; if large and liberal, our aim may be proportionally higher; but the higher our aim, the more generally simple and uniform must be our work. It is said that grand ideas are always simple, and I believe that the greater true grandeur a building has, the simpler will its general treatment be. But let us not suppose that simplicity alone will produce dignity. Meanness or meagreness is as incompatible with simplicity as grandeur itself is; and whenever true dignity is beyond our means, let us aim at some lower order of architectural beauty, such as prettiness or picturesqueness, or at whatever else may be within our reach.

If, however, we do aim at mere prettiness or picturesqueness in works which, from their scale and pretensions, ought to be impressive and grand, we fail at once from the highest to the lowest grade of architectural beauty. But in all design it is of far greater consequence that the laws of fitness should be followed than that a rigid uniformity should be observed. The ends of nature and of necessity must be first served, and then the ends of art. * * * *

There is yet another kind of deviation from exact and absolute uniformity most necessary to be noted,—a deviation which gives character and consistency to the treatment of manipulated materials, distinguishing them at once from base imitation and from factory production. I refer expressly to the ductile arts of metal-work, embroidery, and sculpture. It is true that these deviations may in some measure exist in machine-made imitation, and that in manipulated work the deviations may be almost inappreciable; but in either case this is rather a defect than a perfection, for in the former instance, such rigid and simple forms as will not weary with reproduction ought to be chosen, whilst in the latter labour is lost, for much of the effect given by manipulation is that the work was incapable of execution by mere mechanism, and directly a work looks as though it might have been executed by machinery,—however much manual labour may have been bestowed upon it,—it betrays an absence of that which might have stamped it as a work of art: not that it is the irregularity itself which makes it good or bad, or imparts the effect; but this sort of irregularity is as it were one of the "accidents" or necessities which as naturally accompany manipulation, and ought to be obvious, as regularity is inseparable, and ought to be inseparable from the productions of machinery. And all labour spent in escaping the condition natural to either mode of execution is labour worse than lost. True superiority will manifest itself much more in carefulness of design than in carefulness of manipulation. A careful and well-directed manipulation may, nevertheless, be considered requisite to the production of a perfect work. This carefulness of manipulation, however, far from implying a rigid and exact uniformity, will the rather show itself in a masterly and spirited deviation from such precision. And this sort of inexactness is of a totally different nature from that of mere carelessness or neglect. The sketchy and unfinished touches of the master convey a signification and a feeling which the rudeness and coarseness of an unskilled hand can never impart.

And once more. There are deviations from uniformity which must be remembered in all constructional work,—in the dimensions of stones, and in the colours of materials. If by general design these are regular, whether in alternation or other regular succession, they may be, or rather in most cases must be, sufficiently irregular in detail to take off all effect of a laboured monotony. Alternation, whether in the size or colour of jamb-stones or arch-stones, may be as irregular as the nature of the particular material properly necessitates; but some sort of purpose ought to be evidenced in their general disposition. If regularity be too strictly followed in alternations or contrasts, the regularity calls attention to itself, to the detriment of other general effects. If it be insufficiently marked, it loses its power. Windows similar in outline and section, or moulding, may vary in their tracery to a small extent, but the less the effort to produce the needful variety, the better. The shafts of pillars of coloured marbles may be diversified to almost any extent; but if there are very strong contrasts of light, and dark in the various kinds employed, it is the more necessary that a general purpose should be apparent in their arrangement. Or when stone not indigenous is introduced with local stone for the sake of colour, if the colours contrast strongly, the greater must be the care, by uniformity of arrangement, to show, not merely the intention of their introduction, but design. And if the colours are but slightly different, a beautiful softness of effect is obtainable by uniform arrangement,—beyond and above that which in any case arises from the indiscriminate use of stones whose surface texture is un-uniform; for this random use of un-uniform material, if the variations in tone are not too great, is itself very effective. But if these variations are great, so much greater must be the care to avoid a motley or spotted appearance. In bands or drips of brick employed for constructional polychrome, the very variety in the tone in different individual bricks of the same sort gives a pleasing play of colour; whereas if the grey bricks are coloured with lampblack and tar, the red bricks with ochre or brick dust, or the buff bricks with yellow ochre or copperas—as the workman commonly likes to do, and, in fact, will do, in spite of all threats and warnings, unless his supervisor looks very closely after him, for the sake of uniformity in colour, which he denominates "neatness,"—the effect is irremediably ruined.

Uniformity and diversity not only have each their own proper force, but they derive additional interest and power from their mutual contrast on the one hand, and mutual support on the other. It may be sometimes difficult for even a refined taste to determine exactly in particular instances whether a work has that pleasing or that unpleasing and distracting variety which renders it good or bad. In such cases there cannot be much amiss (as regards uniformity) if some other accessory does not place it beyond question in some further respect.

But, on the other hand, in designing, or in arranging, forms borrowed from nature for architectural purposes, we recur to a treatment the very reverse of this. We have been considering the execution rather than the form or the arrangement. The form and general arrangement of natural forms, for architectural purposes, must be uniform and regular. Thus we set out our centres and leading lines with accuracy and precision. We balance flower with flower, and form with form. We divide up our spaces and scatter our patterns with even hand. The powdered ground is carefully and evenly covered with regular outlines. We arrange stems and leaves with a regularity almost formal, and our vines and roses cluster round our capitals in precise and measured outlines, contrasting strongly—some may be tempted almost to say strangely—with the free and unrestrained manner which characterizes nature. Some there are who scorn this formal and conventional manner in the representation of natural forms, as derogatory to an enlightened epoch of art,—as worthy only of a dark and ignorant age, when people had no real love for or appreciation of nature, and lacked the power of following her graceful lines, unable alike to imitate accurately and to draw correctly. But so far from this being really the case, no age has ever yet equalled the thirteenth and fourteenth centuries, either in the true appreciation of nature, or in the incorporation of her life and spirit into their works,—not in a tame and lifeless imitation, but with a grace and refinement almost unattainable now. Imagination and poetry sought expression in language borrowed from nature, and the hand of the artist gave unmistakeable proof of proper architectural treatment of such forms, consisting, not in naturalistic copying or in mechanical imitation, so much as in following the spirit of the generic form in the original. Such forms must be not only arranged or grouped, but even represented in a geometrical, regular, and conventional manner, in order that (as I have had occasion already to observe) the hand and power of the artist may be strongly evidenced in the "motif" or design, apart from and independently of the original or generic form from which the artist's idea was borrowed.

The reason of this appears to be, that although we can mechanically imitate or reproduce almost every natural form, yet we cannot impart to our work that spirit and tone which are to natural forms what we call life, and hence our reproductions fall signally short in that very highest particular of all, which evidences the creative power of the hand which produced the original. Since we are unable, then, to impart to our copy the life manifested in the original, it is needful for, as it is also the province of, the artist, to impart a life and an interest of another sort; a life and an interest which do as really and truly show, though in a feebler manner, a plastic or creative power, moulding it by design to the form which it has assumed. Thus the stars in the heavens, the birds in the air, the sheep on the downs, are scattered in free and harmonious grouping, so to say, at random. But when the architect begins to scatter golden stars at random upon a vault of blue, he has no power of thus arranging them so as to show design or to produce beauty.

The last kind of uniformity of feature which we have to consider is the reiteration or repetition of the same features in the same building. I refer to the repetition of windows and other such details as naturally fall in with the similarity of use and convenience in the same apartment, which, as we have seen, may be similar in general form and outline, and yet, especially in small or picturesque buildings, may vary in detail, if the variety is not so great as to detract the eye, whilst, in several apartments of different constructions or appropriated to different purposes, the treatment may and ought to be more widely different; as, for instance, the treatment of a window in a gable might be arched, whilst, under the eave of the same roof, or under an upper floor, it might be, without discordance, square-headed. One window may be high and another low, according to the variety of requirement. A buttress may be constructed to counteract a particular thrust from the inside of a building which may not be required, and may therefore be omitted, in an apparently corresponding position. Corresponding buttresses would be treated alike in regard of their forms and weatherings; but if any one in particular was unduly weighted from within, the treatment may be varied to meet it; but then it must not be a slight or imaginary work which it has to do, for all the buttresses ought to be more than strong enough to resist the whole of the pressure which they may have to bear.

But reiteration or repetition is in itself proof, as has been often alleged, of poverty or incapacity in a design. It may be, and often is, a proof of power. It is becoming too much the fashion to denounce a work *for* its uniformity. And true it is that, in many a building of modern erection, uniformity does add to the meagre effect of work commonplace and void of interest in other respects; and yet this very sameness, so to say, may enhance the dignity and grandeur of a work otherwise noble. We may weary of the monotony of the four square walls and windows of the ordinary suburban villa, or of its reduplicated form in an hospital or a workhouse; but here there is nothing in the general whole to supply the want of that which the craving taste demands. We never hear of such complaints being made against the uniformity of the Parthenon, or against the repetition of detail of such noble clerestories as those of the cathedrals of Chártres or Rheims. In such works as these great variety, whether in general form or in particular treatment, would greatly distract the eye from the magnificence of purely harmonious effect; but the uniformity, which will add to the effect of a truly well-proportioned and imposing building, will sometimes call attention, as it were, to the very deficiency of a mean or meagre work.

The very reiteration of some particular feature seems to imply that the feature *is* worth reproduction, and thus, by reiteration, purpose, or "motif," may be shown forth more strongly than by any amount of diversity. Often, indeed, repetition of an idea or of an expression may be used for the sole sake of emphasis; but when employed for emphasis the greater care must be taken that the things themselves shall be worth calling attention to. That is to say, that they be in themselves good of their kind; and that the building, to which they act as heralds, be not poor and insignificant. There are examples enough on every side of us in London to demonstrate the certainty of utter failure in aiming at more than can be properly accomplished in this respect. But, on the other hand, what can be more emphatic than two grand

western or lateral towers, equal and similar, and corresponding in position, rising on either side of a noble nave? Two towers, or even minarets, placed in such a position, appear to stand forth as "supporters" to some other more important, though less conspicuous, member of the fabric. A single tower proclaims, as it were, its own dignity and its own purpose with less direct reference to the relative importance of the rest of the building. I am far from urging that a single isolated and independent feature may not be so treated as fairly to fulfil the requirement of high art; and it is possible that the same expenditure upon a single tower would often give greater effect than if divided into two. Neither would I pass by the fact, that some of the most imposing and magnificent examples consist in single towers, upon which the architect's whole energy appears to have been concentrated. But commonly, if there are two towers, they ought to be similar in outline and general treatment.

In good work of the best periods we often do find a great dissimilarity between them. This dissimilarity, however, is rarely, if ever, found in the case of two exactly coeval towers, or of two side western portals, or other similarly corresponding features, which can be taken in by the sight at the same time. In many, perhaps in the majority, of those towers that are thus counterpoised and otherwise similar, there is a slight difference in the treatment of detail; and this again shows the more forcibly the care taken to assimilate the outlines, subordinating the detail to the general effect. In case of transepts, aisles, or porches, however, which, being on opposite sides of the fabric, cannot be seen at the same time, the diversity is allowable, giving scope for a pleasing variety and the display of individuality of treatment. That such diversity is justifiable in the case of two western or otherwise corresponding towers is not so evident, for in a large building each tower may be considered of sufficient importance to be taken almost as a separate whole by itself, thus affording scope for a separate treatment, and, in very many instances of early examples, the diversity cannot be for an instant regretted. Two noble works of art, emulating each other in richness or in grace, standing as sentinels on either side of the same building, of either of which we should perhaps equally deplore the loss,—two such towers add to general effect almost more by their picturesqueness of outline than they lose by the lack of uniformity. Our hearts at once tell us that each one is grand and true, and we do not—ought not—to pause and inquire whether two towers alike might not possibly have been, in some respects, better or more imposing. Each tower, perhaps, is sufficient to stand upon its own merits as a separate design, and we must not be too critical as to what would or might have been the effect of a different arrangement. Neither can we accept them as precedents for our modern practice; for, when found in good old work, the diversity arises from their having been built at two different periods—it may be but a few years apart,—by different founders, and by different architects. The case, therefore, does not apply, and still less will it appear applicable as a precedent when we consider that in those days there was a strongly-marked uniformity of character, resulting from the development of a systematized and conventional mode of treatment, that gave to the architects of those days a vitality and power upon which individual genius and originality might be brought to bear with the certainty of ensuring the greatest success.

We now bring our subject to a close. I have not troubled you with abstractions, or with definitions. I have dwelt upon the practical and self-evident, rather than attempted to force upon you a theory or a speculation. Not because theory is of no interest or of little value, but because theory is a matter for close, earnest, and laborious study, rather than for popular and general discussion. It is with the results, and with the means of producing these results, rather than with the cause of such results, that most men are concerned. Moreover, it is much more to extend the proper appreciation of art than to propound rules and methods of improving or facilitating design, that all efforts to raise the condition of art must be primarily directed. Proper appreciation is, indeed, within the reach of most men; but power of design, or to be an artist, can never be taught by rules or methods, and rules and methods are all but useless, excepting in the hands of the true artist, who gives himself up to his work with life-long labour and devotion. But let us not rest content with the mere external or superficial view which will satisfy many. Let us, each one for himself, and in his own way, *think out* the subjects brought before us, not passing over apparently trivial minutiæ, but reducing them to some tangible shape and position in taking in the subject as a whole; and let us all labour as though we really and truly did appreciate the supremacy of mind over matter, and of the discriminating taste, when refined and educated by cultivation, over mere natural instinct.

ELECTRO-TELEGRAPHIC PROGRESS.

A new telegraphic company has been established for the purpose of supplying communications between various parts of the metropolis. Already there have been opened thirty stations, the central one in Threadneedle-street; and nearly 100 other stations, including the various railway termini, are shortly to be opened. The tariff of charges (delivery inclusive) is 4d. for ten words; message and reply, 6d.; message of twenty words, 6d. Messages can be sent from the district stations to and from every telegraph station included in the international telegraphic communion. It is to be hoped the fourpenny telegram is destined to initiate a new system, not restricted within merely metropolitan limits. Why should there not even be a uniform charge of 4d., like the penny postage system, over all the country, if not a rival penny system itself, as the *Western Morning News* has recently urged? As this paper justly remarks,—"No invention offers such great facilities at a small cost as the electric telegraph. The erection of the wires and batteries requires but a small outlay; and, when the communication is complete, messages can be transmitted from one end of the line to the other, at the rate of fifty words per minute. The cost of working the telegraph in the Grand Trunk Railway of Canada, for the last twelve months, was less than 1,500*l.*, and the number of messages transmitted during that time was over three and a half millions. *The expense was, therefore, less than one farthing per message;* yet, while messages can be conveyed as cheaply as letters, we are called upon to pay twenty to fifty times as much for the former as for the latter."

The Liverpool Dock Board have resolved, it appears, to give the marine telegraph system of Mr. Lindsay, of Dundee (without crossing wires), a trial across the Mersey, in consequence of the breakage of the wires of the line already laid. A suggestion made to them by a Mr. T. Craig, of Douglas, Isle of Man, to suspend the wires from lofty poles, instead of sinking them to be dragged and broken by anchors, was laughed at by some of the members present; but, as the *Engineer* points out, there was little to laugh at in such a suggestion, considering that "in Paris five or six wires are suspended, with a very moderate deflection, at a distance of nearly half-a-mile, from the residence of the Minister of Marine to the Tuileries; at Kovno, in Russia, the telegraph wires have a clear span of 1,700 feet across the Niemann; in the United States, a telegraph wire is carried, in two spans of 2,400 and 3,720 feet respectively, across the Ohio river, at Paducah; whilst between Turin and Genoa there is one span of three-quarters of a mile (or about that required for crossing the Mersey), between the summits of two ridges of the Bochetta chain."

The Mediterranean Telegraph Company have adopted the report of their directors, which states that the idea of repairing the line from Malta to Cagliari has been abandoned, but that the Malta end of the cable had been taken to Marsala, thus forming a second line to Sicily, in case of any accident happening to the other wires. The report also states that the Government have agreed to divide their guarantee into two parts, so that, should the line between Malta and Corfu, or that between Malta and the Continent, be out of order, one-half of the guarantee will still be received on the half in working order.

STREET TRAMWAYS FOR HORSE OMNIBUSES, &c.

For many years, as a very cursory reference to our columns will show, we have advocated the importance and advantage of street tramways, especially in the metropolis, where orderly procedure and smooth progression are so requisite and desirable. We are glad, therefore, to observe that there appears to be a prospect of a fair trial of the system in the City.

The expediency of laying tramways along the principal traffic routes having been frequently brought under the consideration of the Commissioners of Sewers, Mr. Haywood, their engineer and surveyor, was directed to report on the subject generally, but more particularly with reference to a proposal submitted by Mr. John B. Redman. Mr. Haywood has accordingly presented an able report, in the course of which he says that in great towns the advantages of tramways may be thus stated. First, the diminution of friction, the consequent facilitation of the draught of vehicles, and reduction of the strain of horses; secondly, the diminution of noise and vibration, and the increased comfort, both to travellers and inhabitants, consequent thereupon; thirdly, an increased duration of surface, the consequent diminution in the frequency of surface repairs, with the inconveniences attending reparations. In addition to the foregoing, they are very useful in streets having much pedestrian traffic, where the footway space is small; they prevent to a large extent the splashing from the wheels of vehicles; are always cleaner and drier than ordinary pavements; and are more readily kept clean by the scavengers. For many reasons, therefore, the adoption of tramways, where practicable, in large crowded cities is desirable.

Mr. Haywood thus concludes his report:—

"Under all circumstances, I beg to recommend that about from 1,200 to 1,500 feet of Mr. Redman's cast-iron tramway be laid experimentally in Fenchurch-street, or Leadenhall-street, in single lines next the kerbs, those being placed where reparation must be made in the approaching spring, and where, from the severe nature of the traffic, the several heads of security, duration, or cost, can be advantageous tested and studied. This can be done certainly with but little if any pecuniary loss, and I believe with positive gain, and information will be obtained which no public body in the metropolis is so much interested in acquiring as your honourable commission."

In America street tramways have for some years been in actual use, and their advantages are so highly appreciated that there is not the least probability of a withdrawal of them. There are five lines in the city of New York. In 1858 they carried upwards of 27,000,000 of passengers, being an increase of 17 per cent. over 1856; and only twelve accidents occurred among 35,000,000 passengers in Brooklyn and New York together. The shares are at 40 premium, and paying dividends from 10 to 14 per cent. "So popular have the roads become," says a recent letter from New York, "that daily applications are made to our authorities for new grants, in many cases filibustering on those laid down." The growth of New York has been greatly aided by these facilities of travel. In the United States they are laid in New York, Brooklyn, Philadelphia, Boston, Cincinatti, and other cities, and all pay large dividends. Why should the metropolis, as well as Glasgow, Dublin, Manchester, Liverpool, and other great towns, be without them?

We may refer those of our readers who feel an interest on the subject to a pamphlet by Mr. G. F. Train, just published, by Low, of 47, Ludgate-hill, in the form of a letter, addressed to the Right Hon. Milner Gibson, M.P., President of the Board of Trade, and titled "Observations on Horse Railways," in which the American experience in such tramways is fully treated of.

The *Times*, in opposition to Mr. Grantley Berkeley's prejudiced view of this question, advocates the absolute necessity of some such system in London; but says that "the rail should be laid in the middle of the street, with stations at the chief crossings, while the lighter traffic, and all that had to stop in the intervals, would naturally take the side." For omnibus tramways, however, the sides, next the pavements, would surely be the most fitting, while the common highway would best occupy the middle of the street between the two lines, at least in thoroughfares admitting of three distinct wheel-ways, whether trammed or not. One line of tramway only would, we fear, be worse than useless, as meeting vehicles would perpetually obstruct each other, and better have two such lines without any untrammed way between them, than one line with two untrammed side-ways.

PROGRESS OF DOCK WALLS AT LIVERPOOL AND BIRKENHEAD.

Dock masonry is progressing at Liverpool and Birkenhead. The dock and river walls are, for the most part, rubble, or irregular masonry set in engine-ground hydraulic mortar. The walls are about one-fourth mortar. At the several establishments, not much less than a hundred mortar-pans are at work, grinding with a power of some three hundred horses. If we take ten hours as a working-day, and each pan grinding one cubic yard per hour, this will give 1,000 cubic yards of mortar, or 4,000 cubic yards of masonry, per day; and taking 300 working-days per year, gives 300,000 cubic yards of dock masonry per annum. The mortar is made from Alkin mountain lime, and costs, ground, about 10s. per cubic yard. The masonry set in the work costs, with all expenses, staging, &c., about 15s. per cubic yard. Dock and river walls are set to a slope of 3 inches to each foot vertical, or ¼ to one on face; 6 feet thick at the coping; 12 feet thick at 30 feet depth and in like proportion for extra depth.

THE ARCHITECTURAL ASSOCIATION.

The ordinary meeting of members was held at the house in Conduit-street, on Friday evening, the 3rd, Mr. J. W. Penfold, president, in the chair.

The minutes of the last meeting having been read and confirmed, Mr. Arthur Smith, of 15, Great Castle-street, Cavendish-square, was unanimously elected a member.

Mr. Druce then brought forward the resolution of which he had given notice at the meeting of the 6th of last month, that a class be formed for the purpose of learning and practising wood-carving and modelling, to be held at seven o'clock in the evening of the Class of Design. Mr. Druce explained that the only expense attending the matter would be payment of a skilled instructor, to meet which he would propose that a small subscription be raised among the members of the practical class. He should like to hear the opinions of the members on the subject before the proposition was laid before a general meeting. With regard to the actual expense to be entailed by its adoption, he had hoped to be supplied with full information, but was prevented in consequence of the illness of the gentleman from whom he expected to have obtained it.

Mr. Roger Smith seconded the resolution, ob-

serving that a practical knowledge of wood-carving and of modelling was extremely desirable for the proper discharge of their professional duties.

The Chairman, before putting the resolution to the meeting, stated that he was desirous that the studies in connection with the School of Design should be practical, and of a constructive nature. He approved of wood-carving as likely to conduce to that object, but he hoped that drawing and sketching, as now carried on, would not be interfered with.

The resolution was then put, and carried unanimously.

Mr. Blashill then read a paper "On the Application of Iron-work to Architecture."

At the conclusion,

On the suggestion of the Chairman, the discussion was adjourned until the next night of meeting (Feb. 17), and the proceedings terminated with a vote of thanks to Mr. Blashill for his communication.

OXFORD ARCHITECTURAL SOCIETY.

THE first meeting in Lent Term was held on February 1st; the Rev. the Master of University, in the chair.

The subject proposed for discussion was "The use of coloured materials in the construction of buildings." The President, after calling attention to the existence of alternate courses of stone in the vaulting of the cloisters of Westminster Abbey, proceeded to remark on the good effect produced by a variety of colour in constructional materials, whether brick or stone, provided there was not too great a display attempted. The use of colour in constructional materials had not, he thought, been sufficiently studied, as yet, to justify any very decided statements as to what rules should be observed in its employment; but he considered it important not to make too strong a contrast, nor to attempt too much brilliancy. He also called attention to the fact that great care should be taken that the materials should not be of so porous a nature as to lose their colour easily.

Mr. Parker advocated the use of coloured materials of construction, as being likely to improve greatly the effect of buildings; observing, at the same time, that red stone was much more liable to lose its colour than others, and hence that its effect was much sooner lost.

Mr. Buckeridge objected to the restricting of architects in their choice of materials. He observed that coloured materials must be used in courses, and hence that they must frequently be employed to form horizontal lines, which he maintained were not inconsistent with the principles of Gothic architecture.

The President, in conclusion, called the attention of the meeting to a church now building at Highbridge, near Bristol, and stated that, in his opinion, we had yet to feel our way in reference to this subject, and that experience would eventually decide much that was now uncertain as to the most advantageous manner of employing coloured materials.

NORTHERN ARCHITECTURAL ASSOCIATION.

COMPETITION, BISHOP AUCKLAND.

A MEETING of the Committee of this Association was held on the 8th instant, when resolutions were unanimously come to, in reference to an advertisement issued by the directors of the Bishop Auckland Town Hall and Market Company, for the best plan for a Town Hall and Market, to cost 3,500*l.* for which a premium of 20*l.* would be given; the directors, however, not binding themselves to employ the architect of the prize design; and also reserving to themselves the right of purchasing any unsuccessful design for the sum of 5*l.* if not objected to before February the 11th.

It appeared that Bishop Auckland Town Hall and Market Company had returned no reply to the communications addressed to them by the secretary of the Association on the subject.

The following are the resolutions:—

"This Association begs to submit that the premium offered of 20*l.* is not a sufficient reimbursement for the services rendered in preparing the required design, unless the architect of the successful design be employed to carry out the work on the usual terms. The Association wishes to draw the attention of the directors to the fact that a commission of 1½ per cent. on the estimated outlay is the generally required charge for such drawings as are required by the directors.

The opinion of this Association, moreover, is, that justice cannot be done to the building by any architect other than the author of such design.

After what has been stated, as to the value of the drawings required, the Association does not consider it necessary to dwell upon the utter inadequacy of the offer of 5*l.* as a remuneration for the copyright of any unsuccessful design.

The Northern Architectural Association respectfully begs that the directors of the Bishop Auckland Town Hall and Market Company will take these resolutions into their consideration, in justice to their own constituents, and to the architectural profession.

(Signed) JOHN DOBSON, President.
" THOMAS AUSTIN, Hon. Treasurer.
" THOMAS OLIVER, Hon. Secretary.
" J. E. WATSON,
" M. GREENER,
" F. R. N. HASWELL,
" A. M. DUNN,
} Committee."

GRAVING DOCK, DUBLIN.

THE new graving dock for some time in progress of construction at the North Wall Point, Dublin, has been opened. It will accommodate the largest vessels that can enter Dublin, and is at the north-east side of Halpin's Pool. The dock is 400 feet in length, 80 feet wide at top, and 35 feet at bottom, with an entrance 70 feet wide. An engine, 40 horse-power, and constructed by Easton & Amos, of London, with an Appold's centrifugal pump, are used for the emptying of the dock when the gates are closed. Mr. Dargan was contractor for the masonry, which is granite, and Messrs. Wilde & Mallet constructed the gates, which are on a cellular principle, patented by them. Various buildings are in connection with the dock, viz., engine-house, workshops, timber-steaming apparatus, &c., &c. The first vessel admitted into the dock was the *Agnes Anderson*, 200 feet in length, and the property of Messrs. Martin & Sons. It is in contemplation to construct a basin, 1,100 feet in length, close by, and to prolong the present quay considerably beyond the lighthouse.

DINNER OF THE BUILDERS' SOCIETY.

THE twenty-sixth anniversary of this society was celebrated on the 9th instant, at the Freemasons' Tavern, Great Queen-street, Mr. James C. Lawrence in the chair, and was attended more numerously than usual in consequence of recent proceedings, above sixty sitting down. Amongst them were Mr. Henry Lee, Mr. Thomas Piper, Mr. Charles Lucas, Mr. George Mair, architect, Mr. Dunnage, Mr. G. Bird, Mr. James Bird, Mr. Myers, Mr. Plucknett, Mr. Watts, Mr. Hill, Alderman Lawrence, &c.

Mr. Lawrence discharged the duties of his office very ably. In proposing "The Society," he said it had served to turn ruinous rivalry into honourable competition. He dwelt on the importance of maintaining a high standard of character, and hoped every builder would entitle himself to be spoken of as the carpenters were described on the walls of one of the old Halls of London, where it is said the money was not counted that was handed to the carpenters, because they were faithful to their engagements.

Alderman Cubitt was elected president for the ensuing year; and Mr. Lee, in replying for him and for himself, said the society was founded by seventeen builders, who being asked to tender on a specification that did not contain the arbitration clause, had all declined; and this was still the rule of members of the society. Mr. Plucknett replied for the vice-presidents; and Mr. Thomas Piper, as honorary secretary, made, as usual, a very good speech.

A song by Mr. Cole, let us say, in passing, combining feeling with humour, was much more satisfactory than the music of the professionals engaged.

FEMALE SCHOOL OF ART, GOWER STREET.

A MEETING has been held to prevent if possible the dismemberment of this school. It was attended by about a dozen gentleman, who at its conclusion formed themselves into a Provisional Committee.

They first took into consideration the merit and value of the school, and unanimously resolved that there could be no doubt as to its importance and claim to continued support. Next came the question as to whether, with a fair start given to it, by the purchase of premises and other help, it could eventually become self-supporting, and this they also came to the conclusion would be the case after a certain time.

They then drew up a brief statement to be laid before the public, concluding with an appeal for funds to enable them to purchase premises, and establish the school on a firm self-supporting basis independent of the annual Government grants hitherto accorded.

We quite agree with the Committee, that the instructions given in this school are eminently useful, and may be received and eventually turned to profit, without necessarily taking them out of their proper sphere. To throw away the ground won by many years of patient industry would be mortifying, if not foolish; and it is hoped that this appeal on behalf of a school hitherto so ably conducted, and so conveniently situated for the North and West of London, as well as the City, may be liberally responded to, not only by the residents in the immediate neighbourhood, but also by the inhabitants of the Metropolis at large.

STAINED GLASS.

Gloucester.—The restoration of the interior of the west end of the cathedral, according to the *Chronicle*, is now nearly completed, and the memorial brass to the late bishop has been erected. In order to carry out the restoration, the monument of Bishop Martin Benson, which stood on the north side of the doorway, has been removed.

Tettenhall (*Staffordshire*).—A window of stained glass, executed by Messrs. Hardman & Powell, has been placed at the west end of Tettenhall Church, by the family of the late Mr. William Ward, to the memory of their deceased parents. The subjects, eight in number, are, "Missions of Angels to the Earth." The tracery in the head of the window is filled with a choir of angels. Beneath is a brass plate, bearing the inscription.

Glasgow.—A committee has been appointed for the purpose of erecting a decorated window in the crypt of the cathedral, as a memorial of the late astronomer, Professor Nichol. The committee were empowered to collect subscriptions, which it was agreed to limit to 1*l.* each. Mr. James Mackenzie, of Auchenheglish, according to the *Glasgow Gazette*, has kindly consented to place the window adjoining his vault at the disposal of the friends of Professor Nichol.

PROVINCIAL NEWS.

Seer Green, near Beaconsfield (*Bucks*).—Schools have been completed at Seer Green from the designs of Mr. L. G. Butcher. The group consists of residence for mistress on the ground-floor, and bed-rooms on the first floor; a school-room 30 feet in length, 16 feet in width, by a height of 16 feet to the collar of the roof, at which level the roof is ceiled in, forming a chamber for the extraction of the vitiated air. The school-room is planned in accordance with the requirements of the Committee of Council on Education, to accommodate fifty children, having separate entrances for the boys and girls. Each of the entrances has an open-framed timber porch. The material of the buildings is brick, made in the neighbourhood, a few black bricks being introduced in the arches over the windows, and in a band running round the walls both of the school and residence. The roofs are covered with tiles, with bands of ornamental tiles introduced, and finished with a plain tile cresting. The funds were raised mainly by the Rev. H. Herbert, the incumbent of the district, aided by a grant of 144*l.* from the Council on Education. The works have been executed by Mr. Jessup, of Maidenhead, at a cost of 465*l.*, exclusive of fences and fittings.

Moccas (*Herefordshire*).—A rectory house has just been built here for the Rev. G. H. Cornewall. It consists of drawing-room, dining-room, library, and kitchen department, on the ground floor, with eight bedrooms on the first floor. It is built of red bricks, with stone bands. The joinery is varnished, neither painted nor stained. The principal rooms have fireplaces, lined with Poole tiles, and have dog grates. The building looks large from the high road, from being in the form of an L, set with corner towards the road. The total cost is 1,000*l.* Mr. George Truefitt is the architect. Messrs. Evans are the builders.

Manchester.—The Manchester and Salford Banking Company have resolved to erect a new building, for which the plans have been prepared, and operations have been commenced for clearing the ground. The site selected is a central one, at the junction of Mosley-street and York-street. The frontage to Mosley-street is 112 feet, and the depth to Back Mosley-street is 80 feet. Mr. E. Walters, who designed the Free-trade Hall and many warehouses at Manchester, is the architect; and the style he has adopted is the Italian. The building will be of three stories; the lower stage being rusticated, and the windows resting upon some 9 feet of solid masonry, marked only by the simplest lines. The height from the ground to the top of the balustrade will be fully 86 feet. The entrance will be from Mosley-street; there being a broad entrance porch which will be carried

only to the height of the lines of the ground-floor. By a flight of steps, and an outer and an inner lobby, access will be gained to the banking room, which will be 84 feet long, 50 feet wide, and nearly 27 feet high. The floor and the ceiling will be fireproof; and there will be special arrangements for "the treasury." The building will be of Yorkshire stone.

Liverpool.—Messrs. Philip & Son's new premises, South John-street, are finished. The building is about 70 feet by 40 feet, and 60 feet in height, consisting of four stories above the ground, besides the basement, which is half its height above the street, and is intended for superior printing machinery. The front is built with patent pressed brick, and all the doors and windows finished with Welsh stone dressings. The entrance to the saloon is flanked with red Aberdeen granite columns. Messrs. J. W. & J. Hay are the architects; Messrs. Holme & Nicol the contractors for the brickwork and carpenter and joiner's work; Messrs. Parker & Son for the mason work; Mr. Holt for the plumbing, painting, and glazing; and Mr. Thomas Jones for the slater and plasterer's work.

Hull.—It is proposed to provide a public park at Hull, and the town council have appointed a committee to further the project.

THE "BUILDER'S" FIRE.

Some time ago the *Builder* drew attention to a method of laying and lighting house-fires, known now as "the *Builder's* fire." One part of the plan consists in closing the bottom of the grate with a plate of sheet-iron, and this alone will effect a considerable saving in coals. Have a piece of thin sheet-iron cut to the form of the bottom of the grate, and make the fire above it: the sheet-iron prevents the ashes falling through, and produces a more equable combustion: it does not "deaden" the fire, which will burn as brightly and as warmly, indeed warmer, than with open bottom bars. A saving of a fraction of the coal consumed in the metropolis, and a reduction of smoke, are desirable results. The *Builder's* fire will, most undoubtedly, accomplish these: the bottom plate alone will effect considerable saving. I have continued the plan at office and house for some three years, and, therefore, have had this length of experience. Dr. Farr, of the Registrar General's Office, Dr. Southwood Smith, Mr. Graham, of East-lodge, Enfield, and many others, have also adopted the plan, and are satisfied as to the benefit and saving. I only give these names, and my own, as guarantees of the facts stated. Amidst so much trade advertising, and puffing, a disinterested puff, this cold weather, to make the *Builder's* cheap and improved fires burn more extensively, may be allowable.

Robert Rawlinson.

MONSIEUR MAZOIS AND PROFESSOR COCKERELL.

A fresh edition of the elegant volume of Mazois, "Le Palais de Scaurus," has just appeared. This important work, in the form of letters from a German prince, supposed to be residing at Rome, gives, most of our readers are aware, a description of a Roman palace in all the detail of its structural arrangements, embellishments, and furniture, and alludes with minute accuracy to the domestic manners and customs of the ancients, illustrated by numerous plans and views of the parts of Roman houses. This reprint is prefaced by a biographical notice of the author by Monsieur Varcollier, enriched by original materials found among Mazois' papers. A letter to Monsieur de Clarac, dated June, 1815, is of peculiar interest to us Englishmen, and will therefore not be unacceptable, we trust, to our readers, from the tribute it bears to the character of so eminent an architect as Professor Cockerell, when a young man abroad, on his studies, and the moral worth of both these eminent architects, realized in after-life.

"The storm [alluding to the expulsion of Murat and the return of the Bourbons to Naples], has just fallen upon Naples. It has struck down my protectors and dispersed my friends; but there still remain to me my courage, my intelligence, and my love for you. These are more than enough to surmount the new obstacles with which my onward way is so thickly beset. I have no money, which in truth renders my position very critical; and at the same time I am deprived of my pension and of my firmest supporters. Well, let us hope that Heaven will raise up others. Does it ever abandon those who, like me, only entertain legitimate hopes? In the meantime I must have assistance, and endeavour to procure me funds without contracting new debts. There is but one means to effect that, which is to sell the little house which still is left to us. My work, the ultimate success of which is ensured to me, will be of greater good than this precarious possession. Besides, the least delay in the publication of my work may be productive of serious consequences.

There is a young English architect here, Robert Cockerell, who has just made a long journey in the East. After having traversed Asia Minor and Greece in every direction, he visited, with the zeal of a clever artist and well-educated man, Sicily, and the kingdom of Naples, and has collected much valuable information. Having heard of the book in which I was engaged, he called upon me; and, finding that our tastes were congenial, we were drawn to each other, and soon became the best friends in the world. The intercourse with such men is not only very precious, but is also very advantageous, as you will see. Mr. Cockerell, with infinite kindness, has offered his services with respect to the introduction of my work into England on his return thither. In the meantime a happy opportunity has arisen, which enables him to render me a still greater benefit. His master, a rich and influential man, in London, as architect to the court, has written to him, saying, that, having formed the project to make drawings and measurements of the ruins of Pompeii, with a view to publication, he begs him to organize this work, and to accept the editorship. Ah! my good friends, what an unexpected blow was hanging over us! Cockerell, with all loyalty and goodness, hastened to reply that the ruins of Pompeii, drawn, measured, and explained, with as much talent as care, had begun to be published two years before,—that it was matter for regret that England should not know of the work when France and Italy already appreciated its merits. Besides which he, of all men in the world, could take no part in a rival work, for he had too great an esteem and respect for the author; and, as disaster and ruin would be the consequence of the competition, it was only consistent with his honour frankly to state the truth, and to decline contributing to the proposed work.

For me the result has been doubly advantageous;—the abandonment of the English project, and the subscription of the English architect. So that, after this providential occurrence, and although I have 10 feet of water in the hold, I am not at all disposed to abandon the helm or the pump. I have all faith in the future.

Mazois."

THE WAR OFFICE AND CONTAGION.

Will you permit me to say a few brief words in reply to "X." I ask this favour, because one does not like to seem inaccurate or unjust; and Mr. Herbert is the very last man towards whom a sanitarian—as I presume, in a modest way, to call myself—could wish to be unjust or inappreciative; besides that, as it happens, I, and others of my cloth, owe him a special and heavy debt of gratitude. When I sent you the note on Camp Hospitals, the War Office circular was lying before me, so that I knew quite well what names were at the top and bottom of it, but I never dreamt of imputing any knowledge of it to General Peel or Mr. Herbert, any more than to the greater War Minister than either about whose time I was gossiping. The term "Secretary for War" seemed a convenient mode of saying from what office the order had proceeded. Besides, have we not heard something of a "Sanitary Councillor" who was to be responsible for these things?

"X." thinks that in strict grammar the second order annuls the first. But the War Department is, like the French king, *super grammaticam*, above grammar. If logic and Lindley Murray are against it, why, *tant pis* for logic and Lindley Murray. It never cancels an order. It only contradicts itself. On looking carefully into the matter, I fear that "X." is mistaken. "Contagious" and "epidemic" are not convertible terms. The first order provides for the fumigation of rooms (page 3) as well as of foul linen and bedding. The second speaks only of the latter. I suspect, therefore, that if, in any instance, "X." were to assert the common sense of the latter, and seek to ignore the antique absurdity of the former order, the War Department might say, with the lady in the "Merry Wives of Windsor,"—"Why, what have you to do whither they bear it? *You* were best meddle with buck-washing."

The order being still in force then, let us pause for a moment and consider the extent of its meaning. Never, surely, has authority laid a ruder hand on opinion, since the Pope, one morning, commanded a hundred and fifty millions to believe the dogma of the Immaculate Conception. For nearly seventy years, ever since the good ship "Hankey," Coxe, Master, sailed southward, ho! for the island of Balama, the world has been fighting about the contagiousness or non-contagiousness of yellow fever. Such another angry controversy has never been known in socio-medical polemics. It has almost raised municipal war in some colonies, as at Gibraltar. It has estranged fast friends. It has made fat sinecures, and has unmade them. It has made enthusiasts swallow black vomit, and sleep in beds in which men had just died of the disease. I myself have seen a letter from New Orleans advocating non-contagion, and written with the black vomit for ink, handed round to a hundred medical students, the writer thinking that he had thus proved his case. Duels have been fought about it. It is said that in one tour of West Indian service, an impetuous Irishman fought three duels about it, and killed his man in the last, without convincing anybody. One really fancied that Lord Shaftesbury's board (1852) had finally laid the ghost of yellow fever contagion, but, with a stroke of Sir Benjamin Hawes's pen, here it is alive and active again. Not boldly asserted, but gently implied by a conjunction, here is a formal resurrection of Dr. Chisholm and Sir William Pym. Sir Benjamin Hawes writes the little word *or* between "yellow fever" and "other contagious disease," and, forthwith, all the old discarded properties must be furbished up, and put on the stage again; all the obsolete absurdities must be revived: yellow flags, the *quarante jours* of "expurgation and disinfectation," tobacco-smoked letter-bags, meat steeped in vinegar, oilskin dresses, restricted commerce, broken hearts, and a *cordon* of sentries, to shoot even a rat if he tries to pass from one house to another. Look again at another result. I, for one, had read myself into a belief in the "localizing causes" theory. Need I say that since Waterloo-day, 1859, I have abandoned that foolish modern innovation, and have dutifully returned to "the wisdom of our ancestors."

Now, seeing that we have, just at present, a Secretary for War who is not only an enlightened sanitarian, but also a man of great and acknowledged taste, what I would like to say to Mr. Herbert, if I could approach him, is this—and I hope that "X." would agree with me:—If we *must* have the closed doors, the closed windows, and the stinking cauldron, let us also have something æsthetic,—the appropriate trio from Verdi's "Macbeth," for instance. Unluckily, so many "departments" are to be concerned in the process that the music would surely be out of all time. Cwm.

THE RIGHT OF COUNTY SURVEYORS TO RETAIN THEIR DRAWINGS.

The question on this subject between the county magistrates of Norfolk and Mr. Brown, their late surveyor, has been arranged. It will be remembered that the Court of Quarter Sessions held on the 5th of January refused to accept either of the offers made by Mr. Brown. The first proposition was moved by the Dean, "To allow the clerk of the peace, or any person appointed by them, to make, for the use of the present and future surveyor, copies or tracings of all the plans and specifications prepared by the late surveyor for the works executed under his superintendence as county surveyor, or to furnish copies upon being remunerated." Mr. Brown's other proposal was, "That the matter in dispute should be referred to two eminent metropolitan architects, with power to call in a barrister as umpire." And they finally determined to instruct the committee who had reported the matter to enforce their claim by legal proceedings if they could not effect an amicable arrangement. On the 11th of January, the clerk of the peace served Mr. Brown with a formal notice and demand for delivery of the plans, to which Mr. Brown's solicitor made the following reply:—"Sir: I have conferred with my client on the resolutions of the magistrates, together with the proceedings (as reported in the Norwich papers) of the court at which they were passed, and we see no reason for altering either our views or our position. The demand is, at least, an unusual one; and I find that no plans were delivered to my client when he entered on the duties of his office. I need not repeat here his views and reasons, which have been already explained to you, except by stating that his claim to retain the plans in question is based on the broad ground that they are his own property, by the recognized usage of his profession, and the proper construction of the terms of his late engagement. I may observe that the opinions entertained by some of the magistrates

themselves, and the manner in which the question has been since taken up by the Royal Institute of British Architects, justify the course taken by my client;" and he concluded by again offering to submit the matter to arbitration on the terms previously offered, or to adopt the amendment moved by the Dean. On the 28th, the clerk of the peace, instructed by the Castle committee, consented to accept the proposition moved by the dean, and nearly unanimously rejected at the sessions. Arrangements have since been made to carry this into effect, and the drawings are being copied by Mr. Phipson, the present surveyor, Mr. Brown retaining the original plans, his property in which is thus admitted by the magistrates.

Books Received.

VARIORUM.

THE American "Annual of Scientific Discovery; or Year-Book of Facts in Science and Art," for 1860, edited by Mr. D. A. Wells, A.M. (Gould & Lincoln, Boston, U.S., and Trubner & Co., London), has been published. It appears to be as worthy of commendation as ever it was, and forms a very interesting volume, in which many of the facts of the year are treated of at considerable length. The whole is prefaced by some twenty pages of notes by the editor on the progress of science for the year 1859.——A pamphlet, titled, "The Invasion of England rendered impossible, by a simple and practical mode of defence," by a "Member of the Naval and Military Institution" (Hardwicke, Piccadilly), suggests that from Edinburgh, southwards, round the east coasts, and northwards, round the west coasts to Glasgow, all open beaches, mouths of rivers, sea-coast towns, &c., should be protected by long 32-pounder guns, 30 yards apart, the whole series comprising some 60,000 guns, costing, say, 6,000,000*l.*, and to be manned, and sand-bag batteries thrown up in time of war, by coast-guard gunners, aided by crews invited from the respective neighbourhoods, under certain pecuniary and other regulations. The pamphlet also contains an interesting account of eight attempts at invasion. The author is of opinion that the object to be mainly kept in view is to *prevent* a hostile landing, rather than to provide armaments against invaders already landed. —— Mr. E. E. Merrall, C.E., has had published (by Wilson, Royal Exchange) "A Letter to Col. A. Cotton, upon the introduction of Railways in India upon the English Plan." India stands greatly in need of a few thousand miles of railway; but the enormous cost of many English lines, it is to be hoped, will not be incurred in providing these.——Among other books received we may here note "A Manual of Interest and Annuities, including Fifty-four rates of Interest; the Value of Life Annuities, by the English Life-table; and Suggestions for the more equitable Assessment of the Income-tax," by E. Smyth (Routledge & Co.); and "Vacher's Parliamentary Companion," published monthly, during the session, at 29, Parliament-street, Westminster.

Miscellanea.

"PRIVATE" COMMUNICATIONS.—We are requested to express Mr. Falkener's regret that the observations made by him in last week's *Builder* were printed in inadvertence, in consequence of his having omitted to mark them "private."

THE CRIMEAN MEMORIAL AT CHATHAM.—The excavations for the foundation of the Crimean memorial to the Royal Engineers, to be erected at the eastern entrance to Brompton Barracks, Chatham, have been commenced by Messrs. Mansfield & Son, the builders; but, in consequence of the character of the proposed structure, it is probable that six months will be occupied in its erection. The site selected by the Government is the piece of ground between the Hut Barracks and the Brompton Barracks. The architect is Mr. Digby Wyatt. The designs, which have received the approval of the Government, include a large central arch between 20 and 30 feet in height, on each side of which will be a smaller arch, upwards of 12 feet in height and of proportionate width. The general form of the structure will be that of a parallelopipedon, nearly 40 feet in height, 44 feet in width, and 10 feet in depth. The whole will be surmounted by an attic, with carvings in relief. It will be built from Portland stone, with white marble tablets and facings.

THE LOMAS-SQUARE NUISANCE AT CHATHAM.—We are glad to hear that the horrors of Lomas-square, Holborn-lane, Chatham, which the *Chatham News* lately dragged into light, are now in a fair way of being removed; the Local Board of Health and Watts's Charity Trustees having come to an understanding as to the nuisance, which the trustees have promised to abate by the erection of various conveniences and other means. At the expiry of the lease in 1861, moreover, the character of the property will be altogether changed.

ST. MARTIN-IN-THE-FIELDS LIBRARY FOR THE WORKING CLASSES.—The Rev. H. Mackenzie, vicar of the parish from 1848 to 1855, when he resigned, reappeared among his former parishioners on February 13th, and entertained them with a lecture on the subject of "The Young Chevalier and the Battle of Culloden." The reverend gentleman was warmly received by his audience, and a cordial vote of thanks was passed to him at the conclusion of his interesting lecture.

CAMBRIDGE ARCHITECTURAL SOCIETY. — On February 9th, a meeting of the Cambridge Architectural Society was held at the Philosophical Society's rooms, when the Very Rev. the Dean of Ely made a communication concerning the lantern at Ely. He showed by a model the original construction by Alan de Walsingham, pointing out the alterations which it has undergone, so far as can be ascertained. He showed that it was originally a campanile, for there exist documents giving a detailed account of the bells. He explained the several questions which are being discussed concerning the present restoration. In conclusion, he stated that they are still in want of funds for carrying this out. They have under 3,500*l.*, whereas the sum required is 5,000*l.* They intend to commence work in the spring.

GAS.—At a meeting of the Ware Gas Consumers' Company, recently held, it was resolved that 3,500*l.* should be offered to Mr. Holcombe for the present works. He has refused to accept this sum, and has since sold the works to a company in London for 4,000*l.* It is not unlikely, it is said, that the Local Consumers' Company will establish independent works.——The Worcester Gas Company have declared a dividend at the rate of 7 per cent. per annum.——A correspondent of the *Bradford Observer*, asks "How it is that while in Huddersfield the price of gas is 3s. 6d. per thousand feet, and at Saltaire the same price is charged, we in Bradford should be charged 4s. per thousand?" and adds: "It is high time that a Gas Consumers' Association were formed here, to take in hand the whole subject connected with gas supply, with a view to the reduction of the price charged under the present monopoly."—— The convenience of a good steady light, it appears, has been obtained in some of the first-class carriages on the East Lancashire Railway, by the use of gas. The meter from which the gas is supplied is contained in the guard's van. It is conveyed to the roofs of the carriages and through the usual lamp holes. There is one light in each carriage, which is sufficient to illuminate the compartment thoroughly, so that the smallest print can be read. The taps are on the roof. The junction between the carriages is effected by means of a flexible tube, with a little slack.

DISEASES.—Is it not living in a continual mistake to look upon diseases, as we do now, as separate entities, which *must* exist, like cats and dogs; instead of looking upon them as conditions, like a dirty and a clean condition, and just as much under our own control; or rather as the re-actions of kindly nature against the conditions in which we have placed ourselves? I was brought up, both by scientific men and ignorant women, distinctly to believe that small-pox, for instance, was a thing of which there was once a first specimen in the world, which went on propagating itself, in a perpetual chain of descent, just as much as that there was a first dog (or a first pair of dogs), and that small-pox would not begin itself any more than a new dog would begin without there having been a parent dog. Since then I have seen with my eyes and smelt with my nose small-pox growing up in first specimens, either in close rooms or in over-crowded wards, where it could not by any possibility have been "caught," but must have begun. Nay, more, I have seen diseases begin, grow up, and pass into one another. Now, dogs do not pass into cats. I have seen, for instance, with a little overcrowding, continued fever grow up; and with a little more, typhoid fever; and with a little more, typhus, and all in the same ward or hut. Would it not be far better, truer, and more practical, if we looked upon disease in this light? For diseases, as all experience shows, are adjectives, not noun substantives.—*Notes on Nursing, by Florence Nightingale.*

EASTBOURNE DRAINAGE COMPETITION.—The local Board of Health for this town some time since advertised for plans for the drainage of the neighbourhood, to include Eastbourne, South-street, and the sea-side houses. There were fourteen competitors; and the board, at their meeting on Monday last, awarded the premium of 50*l.* to Messrs. Morphew & Green. It appears that the Duke of Devonshire has thrown open a quantity of land for building purposes, which will render a system of drainage absolutely necessary.

"TRAVELLERS' RESTS."—Dr. Kendrick, of Warrington, who has erected a number of "Travellers' Rests" on the highways in that locality, has published an engraving in the *Warrington Guardian*, exhibiting the form and size of these public conveniences, as an inducement to others to do likewise. The "rest" is of stone, slightly rounded on the upper surface to throw off the rain. The dimensions are 5 feet 3 inches long, 22 inches wide, and 16 inches high; and at each end of the centre of the seat, and forming part of it, is one 10 inches high for children, and which likewise forms a convenient footstool for a mother with a child at her breast. The lowness of the seat enables the occupant to bend the body forward, and to rest the elbows upon the knees.

THE DRINKING FOUNTAIN MOVEMENT.—At Yarmouth the fountain presented by the late mayor, Mr. R. Steward, to the town, and placed on the north side of the Town-hall, has just been completed. The water flows from a piece of rough unpolished rock into a red granite basin.——At the Edinburgh Council last week, a communication was read from Professor Balfour as to the erection of a drinking fountain in the quadrangle of the college, which Councillor Hope proposed to be erected at his sole expense. The matter was remitted to the college committee, with powers.——A drinking fountain is to be erected in Elgin, at the west end of the Plainstones, on the High-street. It is to be of cast iron, with four taps and ladles, a trough for horses, a basin for dogs, and is to have a gas-lamp on top. The council have given their sanction to the erection.

THE ELECTRIC LIGHT: APPLICATION TO SURGERY.—One of the greatest obstacles to the success of a surgical operation is the scanty and imperfect light which, in some cases, is the surgeon's only guide, and is fraught with danger to the patient. Thus, the extirpation of a naso-pharyngian polypus is almost performed in absolute darkness, it being impossible to bring a common light near enough to the patient without scorching him. The problem, therefore, of finding a light which might be introduced into a cavity with impunity, remained still to be solved; and from a communication to the Academy of Sciences at Paris, by MM. Th. Dumoncel, Fonssagrives, and Ruhmkorff, it would appear that this desirable object has at length been attained by means of the electric light. A glass tube, having a very small bore, is bent into the form of a heli or screw, and by this means a kind of luminous cylinder is formed, which is sufficiently small to be conveniently introduced even into a narrow cavity. The apparatus has been successfully tried in various dental and other operations.

THE PROPOSED FINE ARTS GALLERY FOR MANCHESTER.—We have already mentioned the scheme proposed by Mr. Thomas Fairbairn, for the foundation here of a permanent and free art gallery and museum on a grand scale. In the letter which he addressed to the local papers, Mr. Fairbairn proposes to erect, in a convenient and central situation, a palace, to be devoted to the arts, at a cost of not less than 100,000*l.* Under one roof he would collect, not only what the city already possesses in its various museums and art institutions, but would construct "rooms or saloons, with a floor area of 3,000 square yards, which would give ample space for the proper arrangement of the largest collections of pictures and drawings of the ancient and modern schools, and would permit, also, if desired, a chronological arrangement of the works of the several masters. In addition there should be corridors for works in sculpture, both original marbles and copies of the famous statues and groups which adorn the various capitals and cities of Europe. It might further be found exceedingly advantageous and interesting to devote one extensive hall to the portraiture of Lancashire worthies and local benefactors,—a hall of fame, where aspiring youth might muse upon the features of the mighty dead, where one could claim a kind of acquaintance with the men whose genius and inventions had not only created industries, but built up empires; and with the illustrious men and women who, as authors or artists, philosophers or philanthropists, had shed a lustre upon the places of their birth."

Waste in Brickmaking.—Mr. C. E. Bernard was summoned before the Cardiff Police Court, by James Stockbridge, for refusing to pay him two days' wages. Stockbridge said he was a brickmaker, and engaged by Mr. Bernard last spring at 5s. 6d. per day. On the 17th of December he left work and was paid up to the 15th. He summoned Mr. Bernard for 11s. due to him for the two days. He was engaged by the day. Mr. Bernard said he had an account from plaintiff of bricks on the ground, burnt, unburnt, and waste: in order to check it, he sent a person to measure them, and he made the number 23,000 less. The bricks on the ground, of all descriptions, and those sold, ought to tally with those made and paid for. He had paid for 200,000 which were deficient on the year.—Plaintiff: There was a frost last spring which spoiled 30,000. I have not charged for a brick that is not made. You promised to make me a handsome present: have you done so? No; but you sack me in the middle of winter.—Mr. W. H. Hawkins, in the employ of defendant, said he measured the bricks, and made them 23,083 less than plaintiff. There was a number of bats measured. Case dismissed. Plaintiff said he should apply to the County Court.

Exclusion of Damp from Brickwork.—As we are continually asked to state some mode of preventing moisture from penetrating through the surface of brickwork, we may here, in reply to "A Constant Reader," restate one method which has been already more than once described in our columns; at the same time not committing ourselves to any inference or assertion as to its being the best, or even an eff ctual process. It is said, then, that the evil alluded to may be obviated by the following simple remedy:—Three quarters of a pound of mottled soap are to be dissolved in one gallon of boiling water, and the hot solution spread steadily with a flat brush over the outer surface of the brickwork, taking care that it does not lather: this is to be allowed to dry for twenty-four hours, when a solution formed of a quarter of a pound of alum dissolved in two gallons of water is to be applied in a similar manner over the coating of soap. The operation should be performed in dry, settled weather. The soap and alum mutually decompose each other, and form an insoluble varnish which the rain is unable to penetrate, and this cause of dampness is thus said to be effectually removed. Another method was some time since described (as, by the way, the previous one was) at the Royal Institute of Architects. It consists of sulphurized oil as a varnish or paint, and is said to improve the colour of brick and stone, as well as preserve them. It is prepared by subjecting eight parts of linseed oil and one part of sulphur to a temperature of 278 degrees in an iron vessel. It is said to keep out both air and moisture, and prevent deposits of soot and dirt, when applied with a brush to the surface of a building of brick or stone, or even of woodwork.

Bakewell Hall, London, vulgarly called Blackwell Hall.—This edifice has been employed for ages as a market for all broadcloths brought to London. The *City Press* says,—Its original name was Basing's Haugh, or Hall, from the family of Basing, who originally raised the fabric, and have given their name to Basinghall-street, and to Basing's Haw (corruptly Bassishaw), Ward. Basing's Haugh, in process of time, descended to a proprietor named Thomas Bakewell, in the thirty-sixth year of the reign of Edward III., and from him it took the name of Bakewell Hall. It afterwards fell to the Crown, and Richard II. sold it, with its garden and appurtenances, to the City, for 50*l*. The old hall, after having been rebuilt in 1558, was destroyed by the Great Fire, and again constructed, in its present form, in the year 1672. The building is square, with two courts, surrounded by warehouses, with two spacious entrances—one from Basinghall-street, the other from Guildhall-yard, which is the principal front. The door-case of this front is adorned with two columns of the Doric order, entablature, and pediment, in which are the king's arms, and underneath, the City arms, Cupids, and other ornaments. Within this building, which also has an entrance on the west side, from Cateaton-street, there are divers apartments or warehouses, called by the names of the different cloths. They obtained the names of the Devonshire, the Gloucestershire, the Worcestershire, the Kentish, the Medley, the Spanish, and the Blanket halls, in which each piece of cloth pays one penny for pitching, and a halfpenny per week resting; by which means there arises a large annual revenue, which, by the generosity of the citizens, is applied to the support of Christ's Hospital, and the governors have the sole management of these warehouses.

The Westminster Palace Hotel.—It is stated, and, we believe, correctly, that Government has taken a portion of the great hotel near the Houses of Parliament for three years at 6,000*l*. per annum; and that about May the whole staff at the East-India House will be removed there. Further, that so soon as the records can be removed (probably by December), the whole property in Leadenhall-street will be sold.

Removal of the Metropolitan Evening Classes from Crosby Hall to Sussex Hall.—On Thursday, the 9th inst., the final lecture at Crosby Hall was given by the Rev. T. H. Bullock, the subject being "Wise Saws and Modern Instances." After a vote of thanks to the lecturer, the whole of the audience, headed by the two hon. secretaries, the Revs. Charles Mackenzie and Richard Whittington, accompanied by a few ladies, proceeded to Sussex Hall, and took possession of their new premises. Mr. Mackenzie was called to the chair, and a resolution was passed of confidence in those who had the management of the classes.

Strikes.—For some time great dissatisfaction has prevailed among the nail makers of Sedgley, Coseley, Gornel, and neighbourhoods, at the reduction of remuneration for their work. On Saturday week every man refused to take any iron away from the warehouses, and the workmen have determined not to go to work until they get an advance of 6d. per cwt. The masters manifest a determination not to yield to their wishes, and there is every probability that the strike will last for some time.——Eighty-seven of the Glasgow furnaces have been damped, owing to the demands of the miners for an advance. Neither masters nor miners appear to be inclined to give way, and it is considered probable that the furnaces will remain out of blast during this month at least.

Liverpool Architectural Society.—The usual fortnightly meeting of this society was held on Wednesday night, the 7th inst. in the Royal Institution. Mr. Horner, the president, occupied the chair. Touching the memorial to the town council, adopted at the special meeting of the society, as to by-laws, Mr. John Hay proposed the formation of a committee of the society, to consider the new by-laws, and to report thereon to a subsequent meeting. Mr. Barry seconded the motion, and the following committee was named and agreed to:—Messrs. Horner, Barry, Picton, Kilpin, Ellison, Hughes, Goodall, Hay, Sherlock, Weightman, Huggins, Gee, and Stubbs. Mr. Barry then read the paper of the evening, upon the system of drainage now being carried out for the metropolis. The lecture was illustrated by a map and numerous diagrams.

Nineveh.—At a recent meeting of the Asiatic Society, Lord Strangford read a translation of an inscription of Sennacherib, found on a clay cylinder in the British Museum, which was printed by the Museum authorities. The translation was made by Mr. Fox Talbot. This inscription contains the annals of the two years commencing the reign of the monarch. In it he details the improvements effected by him in his capital of Nineveh. The building of a splendid palace is fully described; the re-establishment of the ancient canals for supplying the city with water, "for the health and comfort of the citizens," and the construction of such new works as were necessary for the same purpose; also the widening of streets and squares, the erection of gates and other embellishments, until the city became "as brilliant as the sun." The inscription concludes by invoking blessings on the restorer of his palace when time shall have caused it to decay.

Masters and Operatives.—The bill brought in by Mr. Mackinnon, Mr. Ingham, and Mr. Slaney contains the following provisions:—Power to form councils of conciliation; powers to her Majesty or Secretary of State to license councils of conciliation; councils to consist of not less than two masters and two workmen, or more than six masters and six workmen, and chairman; petitioners for council to elect the first council; council to be elected for one year; householders and part occupiers may demand to be registered, and have a vote for the council, and may be elected thereto; register of voters to be kept; meetings of masters and workmen to elect the council; voting-papers to be delivered in case a poll is demanded; no voter to give a greater number of votes than the number to be elected; altering or effacing voting paper to be a misdemeanour; election to be declared within seven days of nomination; council to appoint the chairman; appointment of clerk; and penalties on referees, &c., for refusing or neglecting to attend cases of dispute.

TENDERS

For new warehouse, Wood-street, Silver-street, City. Mr. James Murray, of London and Coventry, architect:—

Longmire & Burge	£5,725 0 0
Hedges	5,164 0 0
Jackson & Shaw	4,905 0 0
Ashby & Horner	4,712 0 0
J. & C. I'Anson	4,670 0 0
Piper & Son	4,650 0 0
Lucas, Brothers	4,617 0 0
Brass	4,602 0 0
Jay	4,470 0 0
Myers	4,464 0 0

For the erection of a warehouse in Major-street, Manchester, for Messrs. Rhomer (Brothers). Messrs. Spekman and Charlesworth, architects. Quantities supplied by Mr. Thomas Taylor:—

Southern & Co.	£4,720 0 0
Hay, Cochran, & Co.	4,615 0 0
S. Bramall	4,599 0 0
Bowdon, Edwards, & Forster (accepted)	4,593 0 0

For gasholder tank, 100 feet in diameter, and fence-walls, in Soothill, near Dewsbury, Yorkshire, for the Dewsbury and Batley Gas Company. Mr. Michael Sheard, jun., architect, Batley:—

Whitworth & Ingham	£2,500 12 0
J. Brooke & Co.	1,870 18 3½
James Brier	1,672 0 0
George Simpson (accepted)	1,563 0 0
Henry Smith	1,456 0 0

For alterations and repairs at the Lord Tyrawley Tavern, High-street, Marylebone. Messrs. Finch Hill & Paraire, architects. Quantities supplied:—

Hill	£1,255 0 0
Turner & Sons	1,247 0 0
Elston & Son	1,224 0 0
Patrick & Sons	1,188 0 0
Brown	1,180 0 0
Selleck	1,036 0 0

For erecting new premises for Mr. William Royce, No. 35, Eastcheap, City. Messrs. John Young & Son, Architects. Quantities furnished by Mr. Shoppee:—

Knight	£1,737 0 0
Mansfield & Son	1,560 0 0
Little & Son	1,527 0 0
Carter	1,489 0 0
Lawrence & Son	1,430 0 0
Conder	1,419 0 0
Axford	1,372 0 0
Coleman	1,359 0 0
Hart	1,339 0 0

For the re-building of house situate in Great Tower-street, for the Corporation of the City of London. Mr. Bunning, architect. Quantities supplied by Mr. Meakin:—

	Amount for the Re-building.	Separate amount for the Moiety of East Party-Wall.
Mc Clymont	£1,850	£32 0
Gammon	1,849	27 10
Jay	1,642	27 10
Piper & Son	1,631	33 0
Nutt	1,630	30 10
Browne & Robinson	1,592	31 0
Sewell	1,591	34 0
Axford	1,515	29 0
Westacott (accepted)	1,497	40 0

For the supply of glazed stoneware pipes and other articles, and also for the excavation and laying of the main sewers, and the formation and construction of the several streets and passages on the Basford Estate, for the Burslem and Turnstall Freehold Land Society. Mr. Ralph Hales, engineer:—

Downes & Mc Dougal	£880 4 0
Lockett & Pearce	812 0 0
Tomlinson & Harpur	730 0 0
James Frayne	670 0 0
Jos. Smith (accepted)	615 0 0

For alterations to the Crown and Anchor Tavern, Woolwich, for Messrs. Reid:—

Pritchard	£815 0 0
Patman & Fotheringham	779 0 0
Wagstaff & Son	775 0 0
Elston	749 0 0

For erecting stabling, &c., for Cranmer Villas, West-end, Aldershott. Mr. C. Marshall, architect

All materials except bricks:—

Snelling	£297 0 0
Goddard	289 0 0
F. Birch	264 0 0
W. Duke	258 13 0

TO CORRESPONDENTS.

J. D.—J. T. C.—J. P.—J. B.—Rev. C. M.—O. J. S.—Mr. P.—E. S.—G. B.—R. G.—Dr. K. (we intend giving particulars; perhaps a view).—T. W.—J. R. T.—R. B. L. (shall have attention).—W. M.—H. G.—W. P.—K. J. S.—Sub (there is no restriction).—E. R.—Sheila.—Mrs. S.

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